

THE IRON AGE

New York, Thursday, February 3, 1910.

Two New Beaman & Smith Special Milling Machines

The nine-spindle milling machine for machining automobile cylinders and the four-spindle axle milling industry has been brought. These two machines are the product of the works of Beaman & Smith Company,

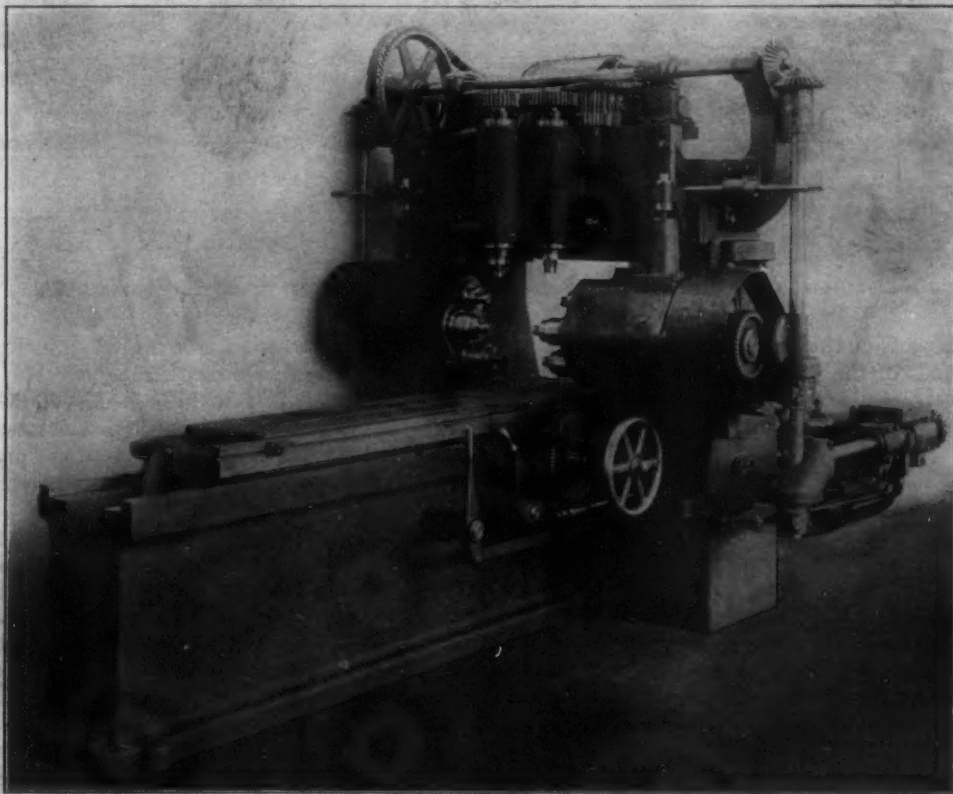


Fig. 1.—Operating Side.

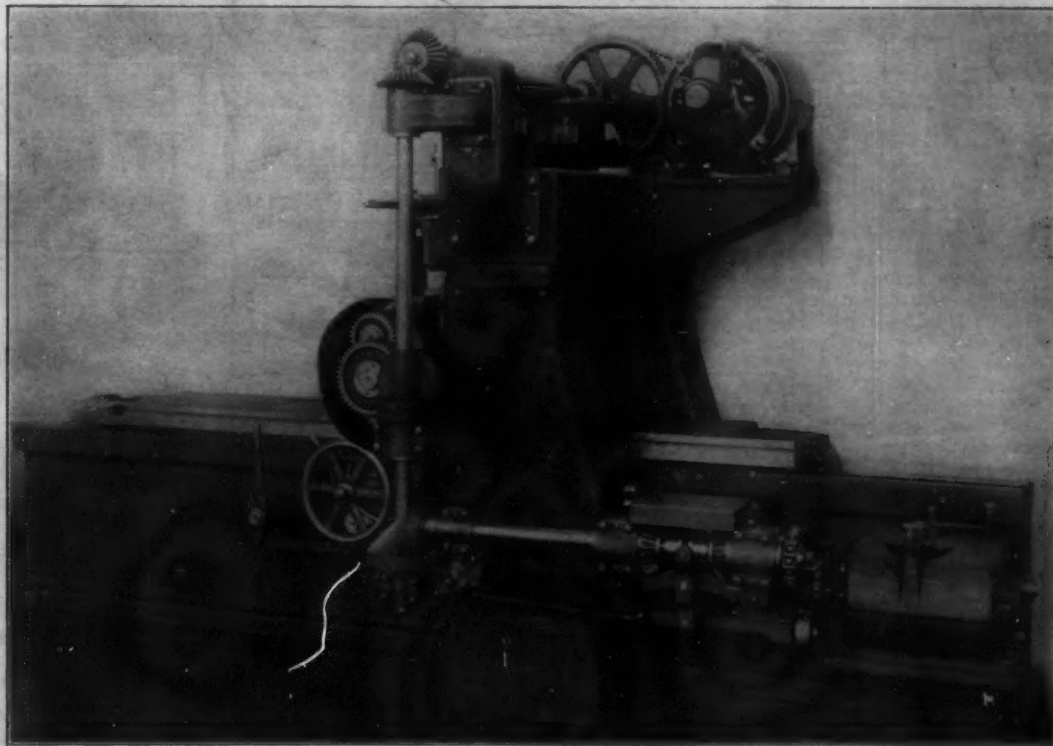


Fig. 2.—Driving Side.

A Nine-Spindle Milling Machine for Automobile Engine Cylinders Built by the Beaman & Smith Company, Providence, R. I.

machine, shown in the accompanying illustrations, afford excellent examples of the degree of specialization to which the machinery equipment of the automobile

Providence, R. I. The nine-spindle machine mills the cylinders in a single operation and the four-spindle machine mills the fork at each end of the automobile

S. DIESCHER & SONS,
Mechanical and Civil Engineers,
PITTSBURGH, PA.

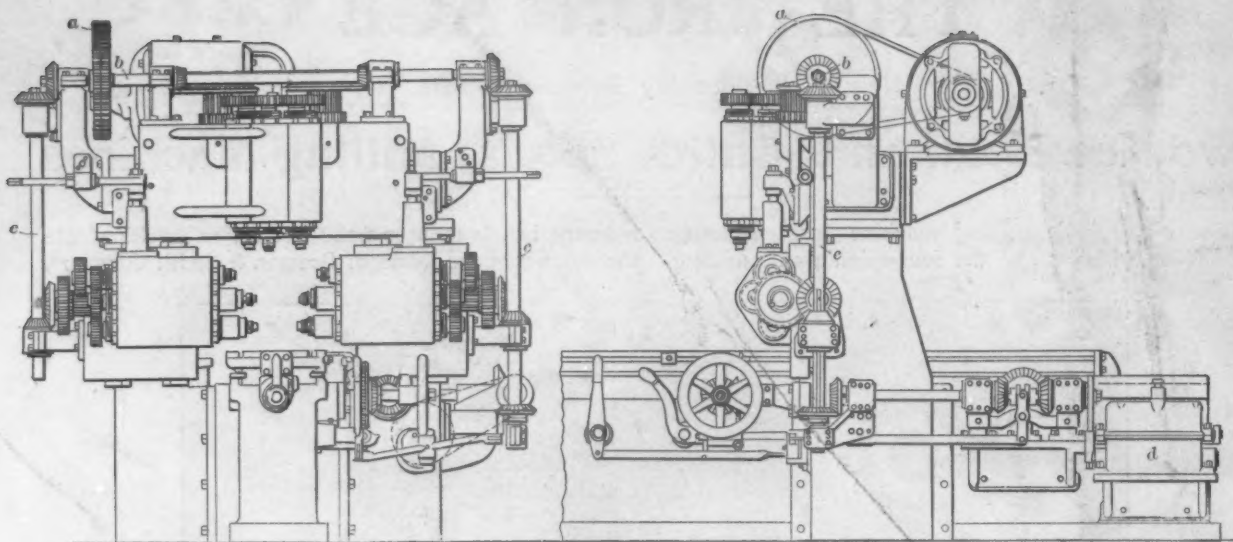


Fig. 3.—End and Side Elevations, Showing the Details of the Mechanism of the Beaman & Smith Nine-Spindle Milling Machine.

axle and also two spots at the same time. The operating and driving ends of the former are shown in Figs. 1 and 2, respectively, while Fig. 3 illustrates the details of the mechanism, and Figs. 4 and 5 show the axle milling machine.

In the cylinder milling machine there are three vertical spindles and six horizontal, each in a quill provided with a slight adjustment which is sufficient to cover the requirements of the machine. The saddles have both vertical and horizontal adjustment. The drive is from a $7\frac{1}{2}$ -hp. motor operating at speeds ranging from 500 to 1500 rev. per min. A chain transmits the power to the pulley *a*, Fig. 3, on the horizontal shaft *b*, whence it is carried through a series of bevel and spur gears to the vertical shafts *c*, and through gearing to the horizontal spindles. The spindles run in hard bronze boxes, and are threaded to receive the cut-

ters. The table, which has a working surface 17 in. wide and 8 ft. long, has a feed mechanism of a standard type of its builder, driven through one of the vertical shafts. It is provided with quick power movement in either direction. Nine changes of feed are provided in the feed box *d*, ranging from 1 to 14 in. per minute.

In the axle milling machine illustrated in Fig. 5 the problem solved by its builder was how to machine the fork at each end and two spots simultaneously. The four spindles do not all feed in the same direction. Those at *e* and *f*, Fig. 4, approach one another while cutting, and the same is true of *g* and *h*. This is accomplished, as shown by the thread on the feed shaft *i*, which is cut both right and left hand to meet this requirement. Gearing from the main driving shaft *j* at the back of the machine drives the feed shaft. The spindles are driven at 17, 20 or $23\frac{1}{2}$ rev. per min. by

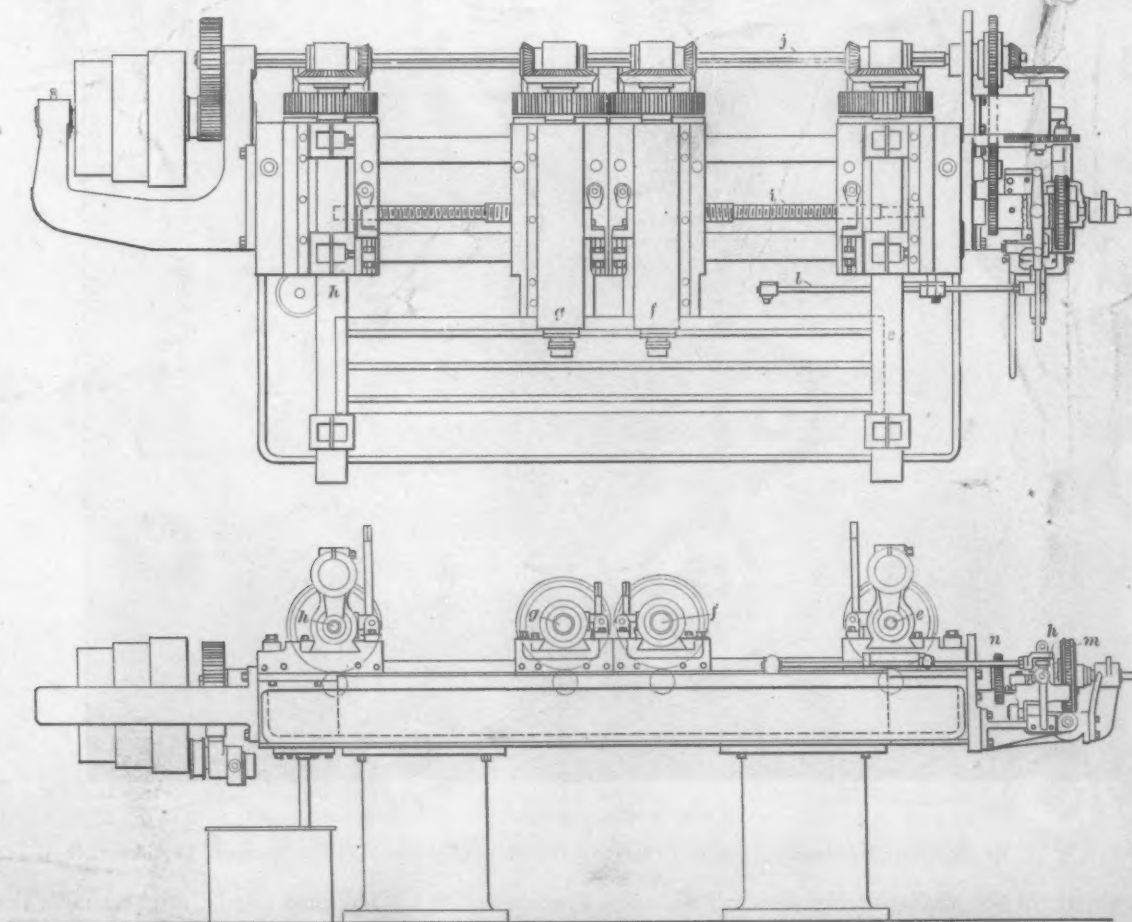


Fig. 4.—Top View and Front Elevation of the Beaman & Smith Axle Milling Machine.

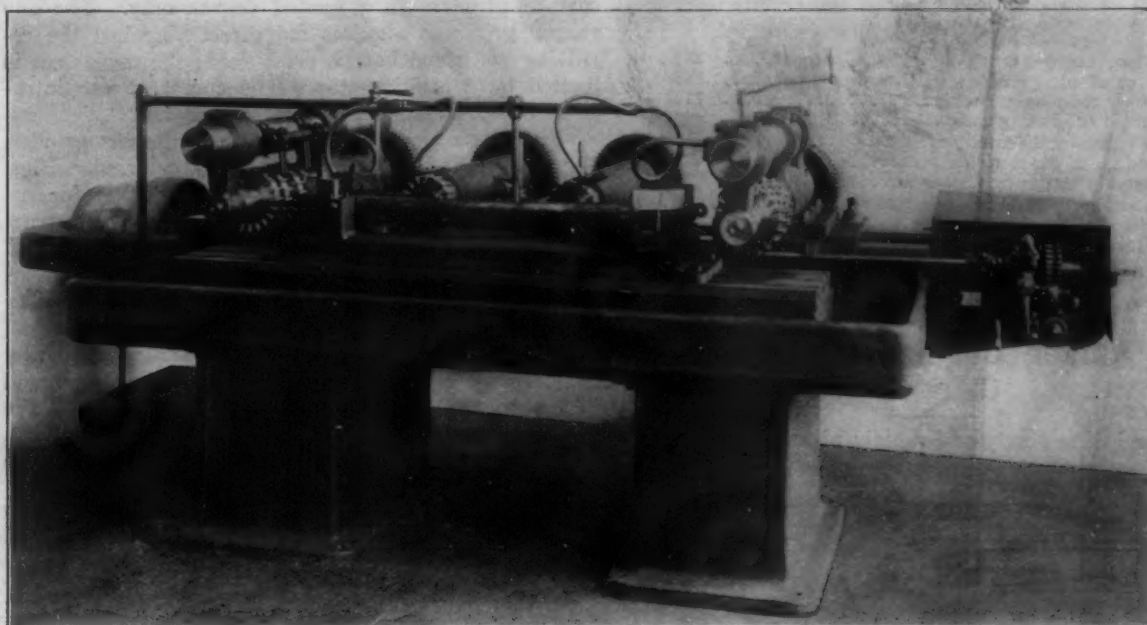


Fig. 5.—A Special Beaman & Smith Machine for Milling the Front Axles of Automobiles.

gears direct from this shaft, and run in hard bronze boxes with taper bearings to take up wear. The outer spindles have supports for their arbors.

A slow feed for cutting and a quick return are provided for by a clutch mechanism at *h*, operated by stops on the rod *l*. During the cut the clutch is engaged to drive through the gear *m*, and during the quick return through the gear *n*. Six feed changes varying from $\frac{1}{2}$ to 6 in. per minute are provided. The bed of the machine is formed as a trough to catch the lubricant in connection with the pump circulation.

Barium in Blast Furnace Slag.

BY R. H. SWEETSER.

When the silica in a blast furnace slag goes below 30 per cent. and the sum of the silica and alumina is below 43 per cent. there is danger of a "lime set" in the furnace, or at least some very low silicon iron, and usually the composition of the slag should be changed at once. Such slags are nearly always hard to manage both inside and outside the furnace, and are so refractory that they require too much coke per ton of pig iron for economical practice. But when a slag with such an analysis is found to be fluid and easy running, and the coke per ton of pig is exceptionally low, there is need for further investigation of the slag.

Such a condition existed at the west furnace of the Columbus Iron & Steel Company, Columbus, Ohio, in November, 1909. The furnace was making Bessemer iron with a mixture that yielded 57.4 per cent. pig iron, and that required only 714 lb. of limestone per ton of pig. A few days after this mixture was put on the furnace the silica in the slag went as low as 28.90 per cent., but the product was good in quality and quantity and the furnace was working smoothly. Evidently there was some unusual element in the slag, and a complete analysis was made at once with the following result:

	Per cent.		Per cent.
FeO	0.40	MgO	5.10
SiO ₂	29.15	BaO	2.45
Al ₂ O ₃	13.40	S	1.85
CaO	45.10		

Here was a slag with 52.65 per cent. of bases and a total of only 42.55 per cent. of silica and alumina; yet the slag was very fluid and easy to handle; it was "white hot" while running and did not slack when cold. It was decided that the barium oxide was the

cause of the lower melting temperature, thus allowing the furnace to work smoothly on a small volume of limey slag. The temperature of this slag while running was not determined, and it would be difficult to calculate the temperature of its melting point from its analysis. Such information would be very valuable and interesting.

In Prof. H. O. Hofman's article on "The Temperature at Which Certain Ferros and Calcic Silicates Are Formed in Fusion, and the Effect Upon These Temperatures of the Presence of Certain Metallic Oxides" (Amer. Inst. Mining Engineers, xxix, p. 682-721), there is a chart showing the effects of BaO and MgO in slags formed in lead and copper furnaces. All these slags contain much FeO and are slags used in smelting lead and copper ores, but it is probable that the influence of BaO would be in the same direction in iron blast furnace slags, as it is in the slags of the non-ferrous metals.

In discussing the temperature curve of the melting point of a silicate of CaO and FeO in which the CaO is replaced by BaO in steadily increasing amounts, Professor Hofman says:

As MgO raises the formation temperature, so BaO lowers it, only that the curve shows more regularity. The melting point descends steadily with the increase of BaO, until six-eighths of the CaO has been thus replaced, when a minimum is reached at 985 degrees C.; but even when all the CaO has been taken away the temperature rises only to 1010 degrees C. The curve shows BaO to be a powerful flux. This fact will be again seen clearly further on in the results of combining BaO with other refractory oxides, as it straightens out their curves and lowers their melting points. MgO, replacing CaO, raises the formation temperature of the basal slag and gives an irregular curve, but as soon as BaO is substituted for part of the MgO the curve becomes more regular, and the melting point is decidedly lowered, or, in other words, BaO promotes the slagging of MgO.

The formation temperature of the above mentioned basal slag is given as 1150 degrees C.

The object of this article is to record some observations made while having a slag with BaO in it, and to suggest more extended experiments with this peculiar combination in blast furnace slags. The results obtained warrant further investigation as to the use of BaO in some form in blast furnace mixtures for the purpose of getting more fluid and easier melting slags. The writer suggests that this be done if any furnaceman happens to have barium in his mixture.

The BaO in the slag came from an ore containing 3.15 per cent. BaO and 59.65 per cent. iron. This ore made up 50 per cent. of the ore mixture on the furnace. The full effect of this mixture was on the furnace for

17 days, and the daily averages of the results were as follows:

Daily product (sand-cast pigs) (2,300 lb.), tons.....	286.6
Coke per ton of pig (railroad weights used), pounds..	1,888
Limestone per ton of pig, pounds.....	714
Ore per pound of coke, pounds.....	2.01
Yield of mixture in pig iron, per cent.....	57.4
Average silicon in pig iron, per cent.....	1.27
Average sulphur in pig iron, pounds.....	0.023
Average phosphorus in pig iron, per cent.....	0.088
Average silica in the slag, per cent.....	30.21
Average alumina in the slag, per cent.....	13.20

The blast furnace is 75 x 17½ x 11½ ft. and is skip-filled.

The Walker Single-Stroke Surface Grinder.

For grinding singly and rapidly piston rings, thrust collars, small dies, milling saws and work of similar

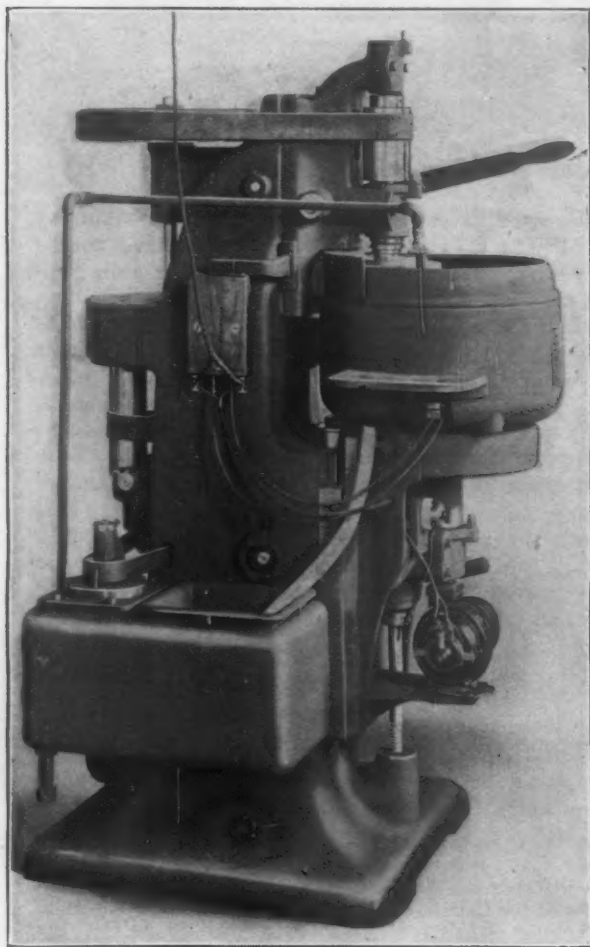


Fig. 1.—The Wet Type.

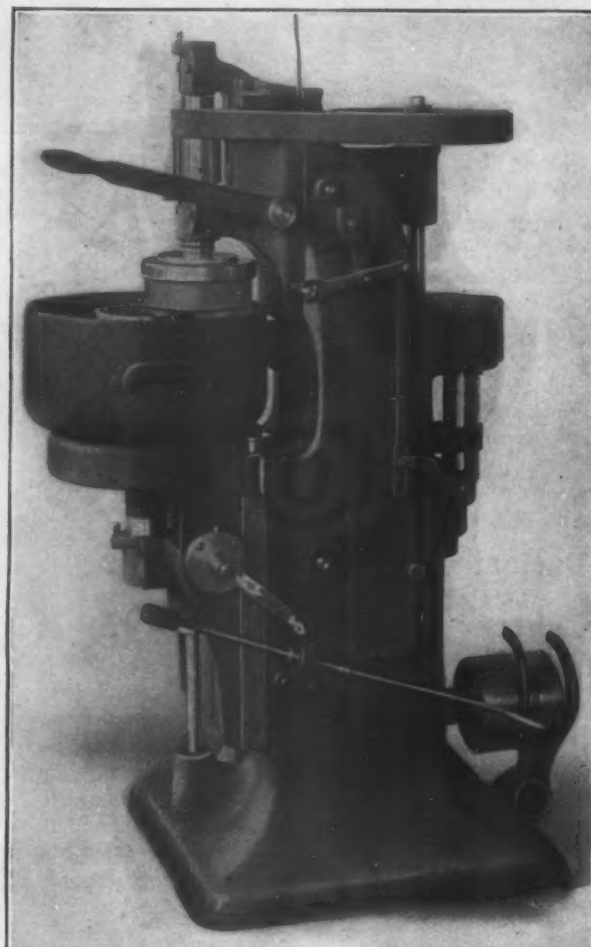


Fig. 2.—The Dry Type.

The New Single-Stroke Surface Grinder Built by the Walker Grinder Company, Worcester, Mass.

character, the Walker Grinder Company, Worcester, Mass., has designed what is known as a single stroke surface grinder. It contains a number of new features, notable among which is its control by a single lever which not only starts and stops the work spindle, but at the same time switches the electric current of the magnetic chuck on and off and automatically demagnetizes the chuck face so that the work may be removed easily and without scratching. The magnetic chuck is of a new design known as the multitooth rotary type, and in combination with it is a new system of chuck ventilation for use on wet grinders. A self-contained motor driven blower delivers an air blast from an outlet through the center of the chuck spindle and thence through the coil chamber and out through apertures in the chuck rim. By this method all moisture is absorbed and therefore none can reach the coil chamber. The machine enters the field of the larger vertical spindle

surface grinders in a limited degree only. The cup shaped grinding wheel is fed directly against the revolving work and has no cross feed; the movement is limited by a positive stop. The company also introduces in this machine a new carbon truer.

Fig. 1 is a view of the left side of the wet grinder, Fig. 2 a view of the right side of the dry grinder, Figs. 3 and 4 give sectional right and left side elevations of the machine, giving the important details of construction, and Fig. 5 shows the new carbon truer.

Referring to Fig. 3, the grinding spindle *a* carries the drum pulley *b*, which is belted from the driving pulley *c* on the vertical shaft *d*. This spindle has ball bearing thrust collars at each end of its lower bearing and carries a cup shaped wheel. The spindle is mounted in a vertical slide *e*, Fig. 4, which is operated by the lever *f*, in the same manner as a sensitive drill press. When the lever is brought forward to its limit the

slide *e* comes in contact with the positive stop *g*, which insures the same thickness for all pieces of work, except for the amount of wear of the wheel, compensation for which is provided by an adjustment of the knee through the vertical feed screw *h*. The slide is counterbalanced by a weight inside the column.

The chuck spindle has a large pulley *i* which is driven by a belt passing over two idlers and through a slot in the column to the driving drum *j*. The drum runs loose on its shaft to which it is locked for operating by the clutch *k*, one member of which is fast in the drum and the other fast to the shaft. The drum rests on a collar which is operated by pivoted and forked levers, push rod and rocking lever, from the stud *l* on the vertical slide. Consequently when the slide is thrown upward, as shown, the drum is raised out of mesh with its clutch and the motion of the work spindles is stopped. When the lever is brought down

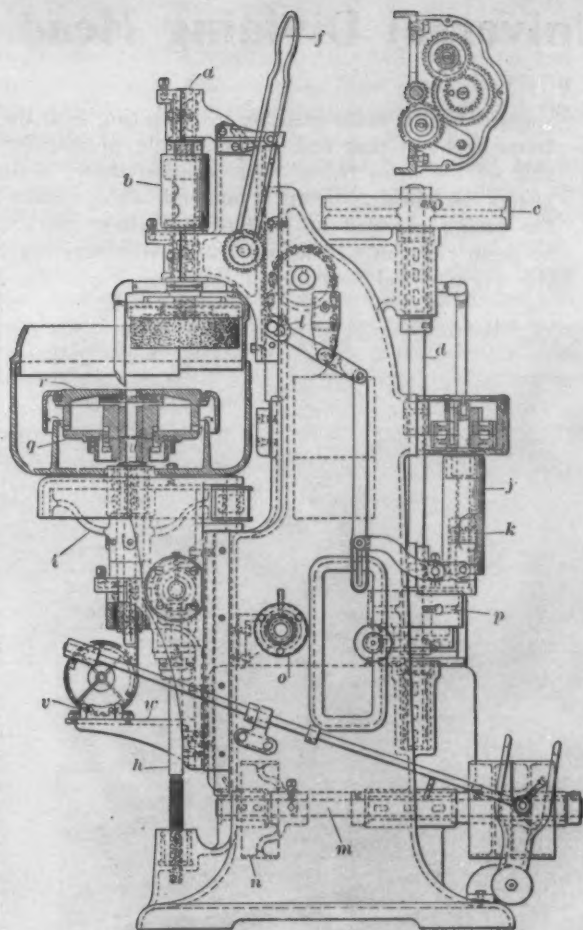


Fig. 3.

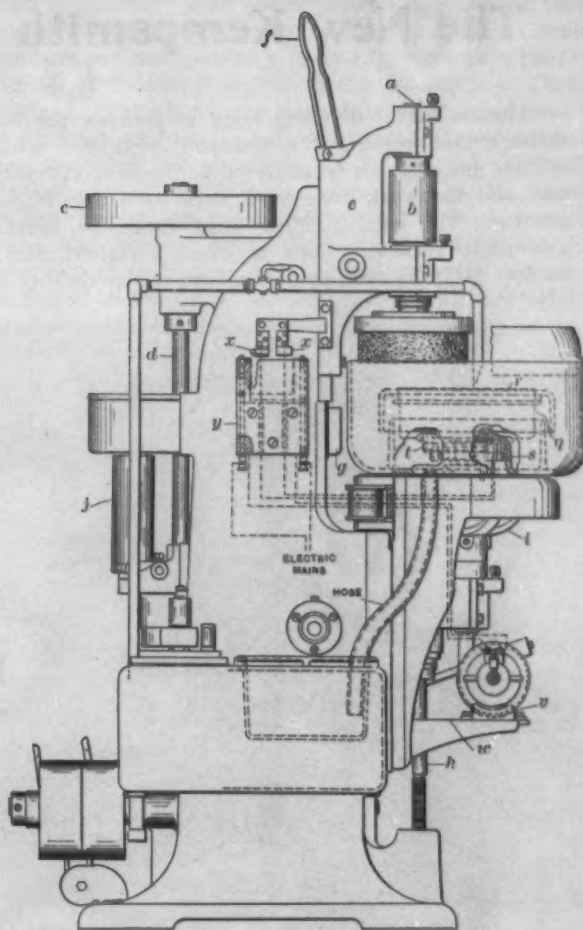


Fig. 4.

Sectional Elevations of the Walker Single-Stroke Surface Grinder.

this action is reversed. Consequently the starting and stopping is entirely automatic and dependent upon the lever.

The drum shaft is driven by reducing gears from the main vertical shaft *d*. The gear box, giving two changes of speed for the work, is shown at the top of Fig. 3. The countershaft *m* has its driving pulley in the interior of the column. The tight and loose pulleys alone project from the machine. From the driving pulley a belt passes over two idlers to the driven pulley on the vertical shaft *d*. It will be noticed that the machine is entirely self-contained, and may easily be adapted for motor drive.

Fig. 3 also shows clearly the magnetic chuck and blower system. The main part *q* of the chuck is 10 in. in diameter. Its magnetic face *r* is provided with a water guard for protecting the contact rings *s* and the brushes *t*. The spindle *u* is hollow. The motor driven blower is shown at *v*, with a portion of the casing cut away to reveal the fan, which is directly connected to a small motor fastened to a shelf carried by the vertically sliding knee. The blower, therefore, never changes its position relative to the grinding spindle. Its outlet is connected by a brass tube with the hollow spindle *u*, and a stream of air follows the course of the arrows, eliminating the danger from moisture.

The demagnetizing device is of unusual interest. It

is characteristic of magnetic chucks to retain a slight residual magnetism after the current has been cut off. To get rid of this more or less objectionable condition a separate demagnetizing device has been designed, and in the case of the single stroke grinder this has been arranged so that the demagnetizing operation is accomplished automatically. In Fig. 4 the apparatus is shown attached to the side of the machine. The two spring contacts *x* are carried by an arm fastened to the wheel slide. The demagnetizing mechanism is contained in the insulating block *y*. The spring contacts operate successively the charging and discharging mechanism in unison with the movement of the slide. As a result, the operation of the lever performs this other function, so that the operator has one hand free for the work. The machine is equipped with water tank and pump and with a supplementary water guard.

Fig. 5 shows the new carbon truer designed to keep the face of the wheels true and at the same time parallel with the chuck face. It is arranged to slide on the platen underneath the wheel. The carbon is set in a shouldered stem fitting a hole drilled in the top of a flat holder in an oblique direction, the angle being 30 to 45 degrees from the vertical. When a flat spot has worn on the carbon the stem can be swiveled slightly and flattened in a new position, thus providing perpetually a means of attaining new cutting points on the carbon and a keen cutting surface on the grinding wheel.

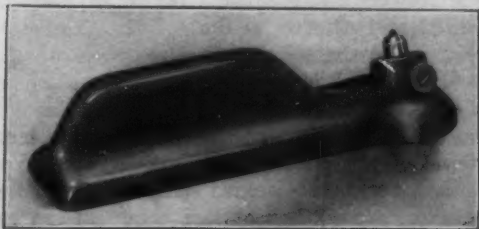


Fig. 5.—The New Carbon Truer for Squaring and Truing the Grinding Wheel.

The new steel steamer of the Miller Transit Company, which will bear the name of Leonard B. Miller of Oglebay, Norton & Co., Cleveland, was launched January 29 at the Cleveland yards of the American Shipbuilding Company.

The Deemer Steel Casting Company, New Castle, Del., now has its plant in regular operation. S. S. Deemer is president and general manager.

The New Kempsmith Universal Dividing Head.

The universal dividing head is perhaps the most delicate and important mechanism connected with a milling machine. It is subjected to frequent and varied use, and the work done by it must as a rule be very precise. The ideal dividing head, therefore, must be essentially accurate; must be of such construction as best to preserve that accuracy, both by its rigidity and

worm wheel is made possible by mounting it at the extreme front or rear end of the spindle, practically outside of the head frame. Its location there, however, brings the working strain at one end of the spindle, and the casing presents an obstruction where work is to be done close in to the head. On this dividing head the worm wheel is mounted centrally inside the head

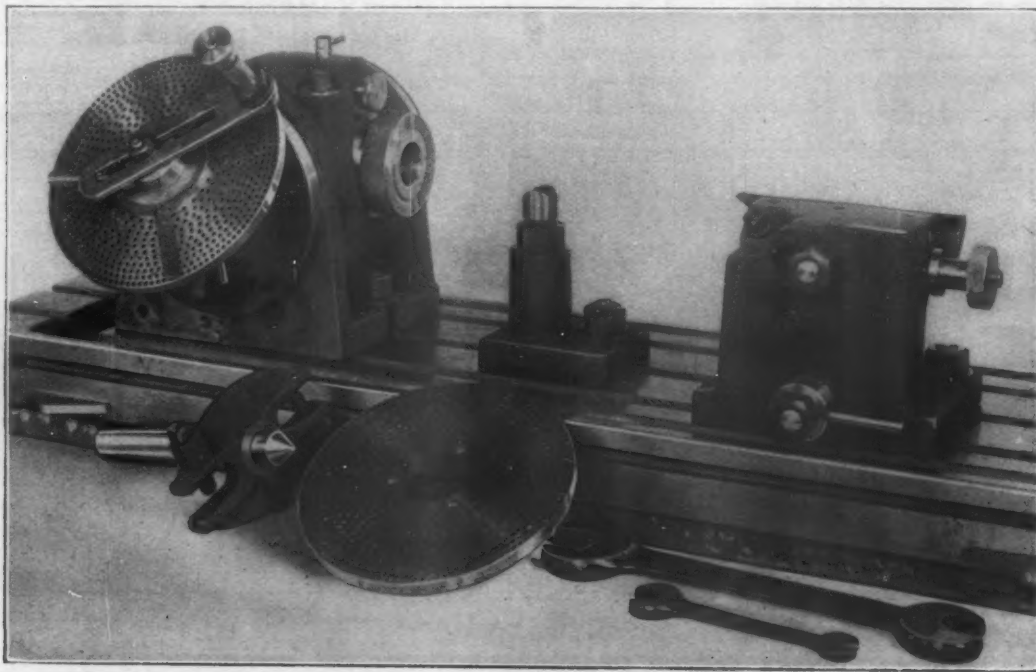


Fig. 1.—Front View.

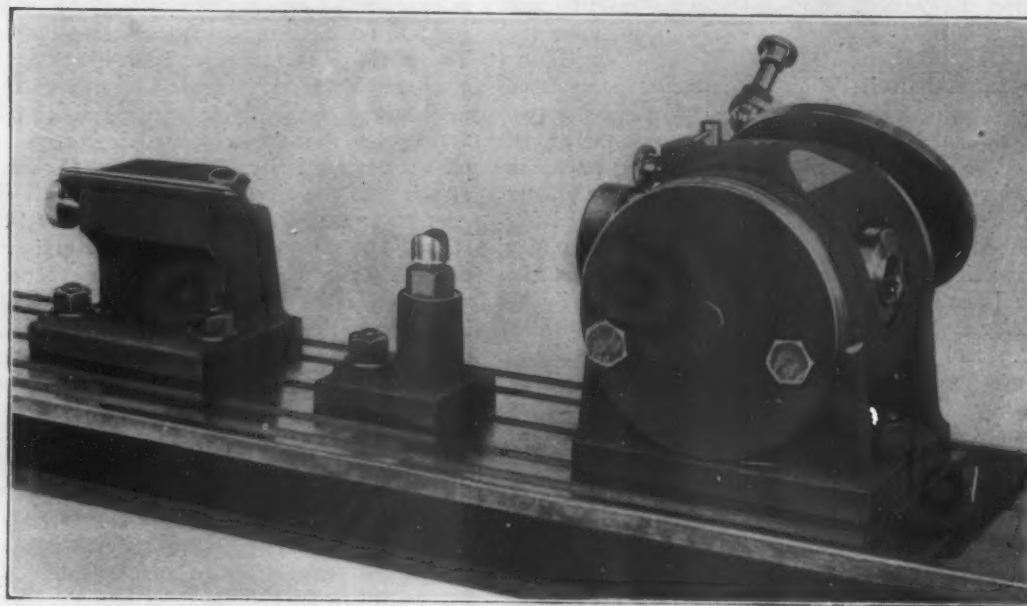


Fig. 2.—Rear View.

The New Universal Dividing Head Made by the Kempsmith Mfg. Company, Milwaukee, Wis.

by its method of adjustment; must be compact and convenient, and universal in its scope. In its new and improved universal dividing head the Kempsmith Mfg. Company, Milwaukee, Wis., has given special consideration to these requirements. The substantial and compact construction is well indicated by Figs. 1 and 2, showing the front and rear views of the dividing head. There is a notable absence of complicated mechanism.

The most important feature of the dividing head is the dividing mechanism. A large diameter worm wheel is essential to the best work. Usually a large diameter

block, between the front and rear spindle bearings. It is keyed and pressed to the spindle, insuring positive movement to the spindle when engaged by the worm. The worm is inclined, its shaft being at an angle of 36 degrees with the horizontal. This brings the point of mesh of the worm with the worm wheel correspondingly around to an angle from the vertical, and makes available considerable extra space for the worm wheel, otherwise occupied necessarily by the worm, when located directly over or under the worm wheel. The result is that the worm wheel can be made extremely

large in proportion to the size of the head— $5\frac{1}{4}$ in. diameter on the $10\frac{1}{2}$ -in. swing head, and $6\frac{1}{2}$ in. diameter on the $13\frac{1}{4}$ -in. swing head. The top view and front elevation of this dividing head given in Fig. 7 show the position and the large relative size of the worm wheel.

The worm is in one piece with the worm shaft which runs in a long and liberal bearing, which extends up to the shoulder formed by the worm proper, and consequently affords support close to the point of mesh. The worm runs constantly in oil, the oil pocket being shown in Fig. 7. The wear between the worm and the worm wheel is very easily taken up through the outside adjusting screw shown. This adjustment is in a straight line, perpendicular to the axis of the worm

plate is vertical. Two index plates are regularly furnished providing all division changes up to 60, all even numbers and multiples of 5, up to 120, and a very liberal number of division changes between 120 and 400. Three special high number index plates can be furnished which provide 122 additional division changes between 61 and 400, including all divisions up to 200 not obtained through the standard index plates. A special spiral milling job of 127 teeth being milled through one of these high number index plates is shown in Fig. 3. This fact of the index plate being at an angle will also permit of still larger plates being mounted in extremely special individual instances without requiring an increase in the swing of the dividing head.

Direct indexing is easily accomplished with the

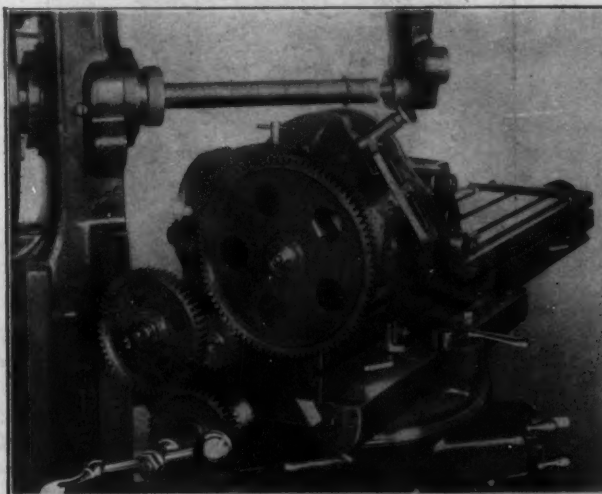


Fig. 3.—A Special Spiral Milling Job Using a High-Number Index Plate.

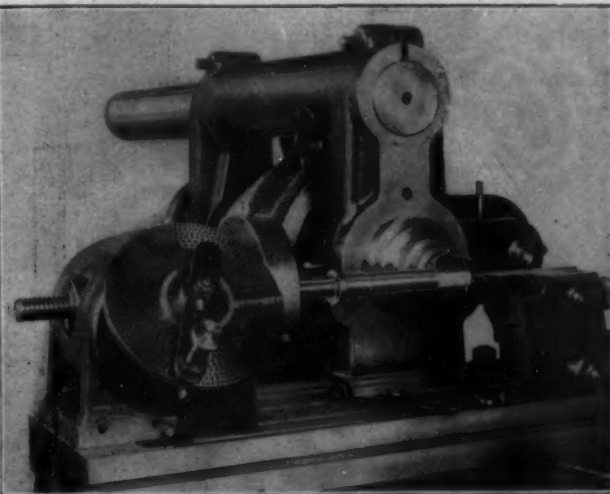


Fig. 4.—A Piece of Work Passed Through the Spindle.
Fig. 6.—Arrangement for Cutting Short Leads, Gearing Direct From the Lead Screw to the Dividing Head Spindle.

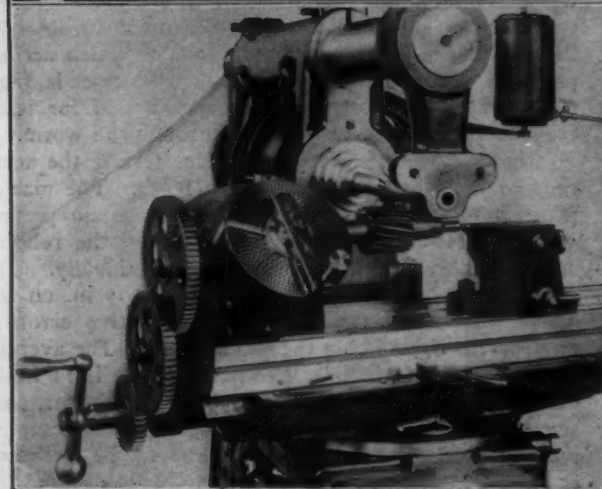


Fig. 5.—The Head Set Up with a Train of Change Gears.

wheel, and thus preserves the alignment and accuracy in repeated adjustments. The worm is easily disengaged from the worm wheel for quick indexing through the worm wheel direct. This is through means entirely independent of its adjustment, which therefore is not disturbed. Another advantage is that, in the common necessity of tightening the nut on arbors which have been put in the spindle, the worm wheel teeth are relieved of strain.

The index plunger is mounted on the worm shaft as shown in Fig. 7, therefore indexing directly to the worm wheel, leaving no chance for error or inaccuracy through a train of gears or any other intermediate mechanism. The fact that the worm shaft is set at an angle as already described, likewise locates the index plate at an angle from the vertical. This makes it much easier for the operator to read in indexing, because it is directly in his line of vision in his natural operating position, and does not require him to stoop and be otherwise inconvenienced as when the index

worm and worm wheel disengaged. The plunger engages the circle of holes in the front of the worm wheel shown in Fig. 7. The spindle is graduated to correspond on the front shoulder and is therefore easily read. Quick indexing, of course, is of advantage when milling squares or hexagons, and in milling taps, reamers or pinions.

The spindle is large, with liberal taper bearings, and has a simple and powerful locking device, shown by the clamp bushing in Fig. 7. It is furnished with the same size taper hole and threaded nose as on the main spindle of the universal millers on which the head is regularly furnished, making all tools interchangeable. It has a large hole running through, as may be seen in Fig. 4, which shows the work passed through the spindle. The rear end of the spindle is arranged to receive an extension stud for use in gearing direct from the lead screw to the spindle for cutting fine leads as described later. The rotating block carrying the spindle swings through an arc of 150 degrees, from 10 degrees below

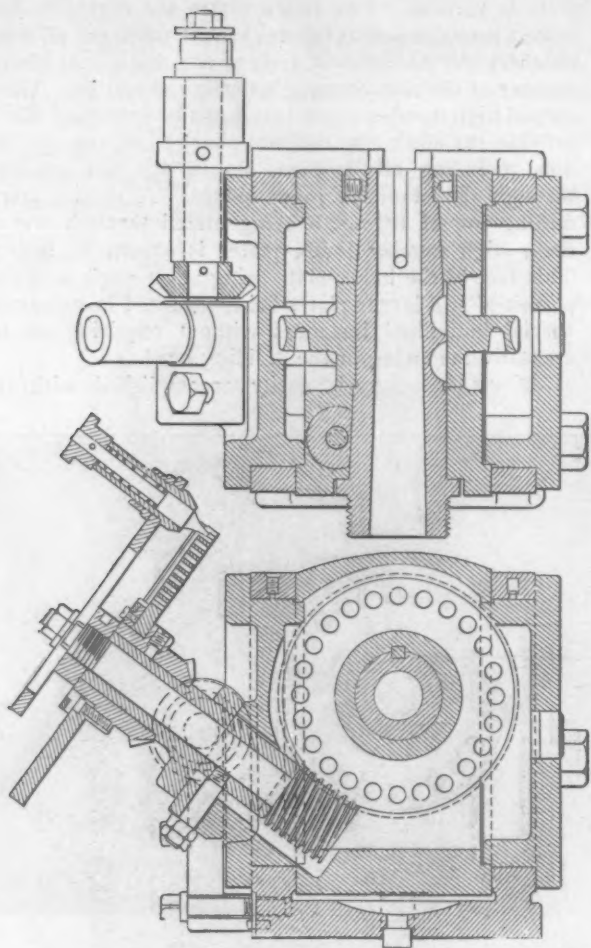


Fig. 7.—Sectional Plan and Elevation of the New Kemp Smith Dividing Head.

the horizontal to 50 degrees beyond the perpendicular. It is powerfully clamped in a horizontal, vertical or angular position through two bolts shown in Fig. 2. These bolts clamp the whole surface of the flanges around the periphery at both the front and rear sides of the head.

This dividing head is furnished with a series of 12 change gears for spiral milling. The change gear bracket is very easily attached or removed. The miter gear on this meshes with the miter gear attached to the index plate; the worm is driven direct from the change gear shaft. Fig. 5 shows the dividing head set up

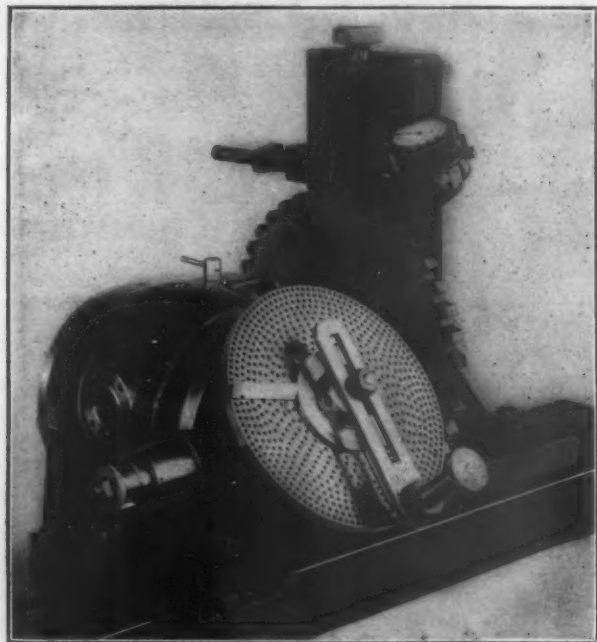


Fig. 8.—Arrangement for Testing the Accuracy of the Teeth of the Dividing Head Worm Wheel.

with a train of change gears in the usual manner for cutting an ordinary spiral; the job shown is a standard spiral milling cutter 3 in. in diameter, 18 teeth, with 48-in. lead of the spiral. For shorter leads the gear ratios increase, and for any lead under about $1\frac{1}{2}$ in. these ratios become so high that practically all the power is consumed in transmission, and short leads therefore are out of the question if attempted in the usual manner. On this dividing head a very interesting departure is provided for short leads, by which the gear train is led direct from the lead screw to the dividing head spindle, and not through the worm, an extension

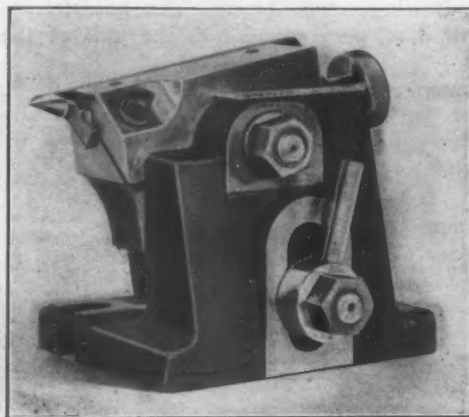


Fig. 9.—The Side-Center Tailstock.

stud being provided on the spindle as already described. This is shown in Fig. 6, and this also shows the use of the universal milling attachment where the angle between cutter and work is greater than can be obtained through the swivel table. In the charts which accompany this dividing head data is given for leads from 0.12 to $1\frac{1}{2}$ in. through gearing direct, and for leads from 1.55 to 100 in. for gearing through the worm.

Fig. 8 shows the arrangement for testing the accuracy of the worm wheel in every tooth. The master plate is mounted in the spindle and has 40 perfect divisions. It is therefore possible to test the relative and cumulative error for the teeth individually. The maximum relative error allowed is 0.0005 in. on the master plate, and the maximum cumulative error at any point is 0.002 in. on the master plate. The average is less than half of this. The master plate is 11 in. in diameter and the worm wheel $5\frac{1}{4}$ in. in diameter, consequently errors on the master plate are correspondingly reduced on the worm wheel proper. The tailstock is of the side center type, which has become associated with that construction, and is shown in Fig. 9. The center is set into the tailstock at an angle, bringing the center within $\frac{1}{8}$ in. of the inner side of the tailstock, as well as within $\frac{1}{8}$ in. of the top. This is advantageous in that it allows the use of large diameter shank or end milling cutters when squaring shafts and doing similar work, thus dispensing largely with the use of very small diameter cutters otherwise necessary. This effectually increases the output of work in such instances. Such a job is shown in Fig. 4. The center is firmly fixed in the tailstock and has rapid and easy adjustment. It can be elevated by rack and pinion for milling tapers and can be tilted and clamped into alignment with the work.

This universal dividing head is furnished in two sizes to swing $10\frac{1}{2}$ in. and $13\frac{3}{4}$ in.

The Berger Mfg. Company, Canton, Ohio, has established Southeastern territorial offices in Atlanta, Ga. J. H. Deering of Atlanta, an experienced iron and steel salesman, has been appointed district manager in charge of all territory between North Carolina and New Orleans. The headquarters will be located in the new Rhodes Building, Atlanta.

The Joyce-Cridland Automatic Track Jack.

A jack for track work must not only be properly constructed and possess sufficient strength for the duty it has to perform, but it should also be quick in action and in releasing. These last features are especially desirable where the train service is frequent.

To meet these requirements the Joyce-Cridland Company, Dayton, Ohio, has built the jack shown in Fig. 1. Malleable iron is used for the frame, and a specially shaped base is provided to insure an easy fit between the ties. In action the jack corresponds to a rack and pinion. The rack is the toothed case hardened crucible steel lifting bar, and the end of the raising lever corresponds to the pinion. The teeth on the end of the latter are cut to fit the rack teeth and roll out of mesh smoothly when the lever is raised to its highest point.

Raising the load is accomplished in a somewhat similar manner to that of the ordinary type of lever jack. One notable exception is that the pawl does not fall into place by gravity, but is actuated by a spring whose action is controlled by a small crank on the side of the jack frame, shown in the lower portion of Fig. 2. In one position of the crank the pawl is held against the rack and permits continuous raising, but prevents lowering of the load. With the crank in the opposite or release position, the spring tends to disengage the pawl from the rack teeth, so that to trip the jack it is only necessary to bear down slightly on the lever bar. This just releases the load and allows the pawl to fly out of mesh. By this method neither the pawl nor the pin-



Fig. 1.—The Automatic Track Jack Made by the Joyce-Cridland Company, Dayton, Ohio.

ion are forcibly thrust out of engagement and this, it is stated, eliminates considerable wear and possibility of breakage.

Fig. 2 shows the details of the lifting mechanism. The crank controlling the spring that actuates the pawl is in the position shown while the load is being raised; that is, the handle is away from the operator. When the rail has been lifted to the desired height the handle is turned in the direction of the arrow through an arc of 180 degrees. The tension on the upper end of the spring is thus released, so that the pawl tends to come out of engagement with the teeth on the lifting bar.

This action is prevented by the weight of the load which holds the pawl in place, and consequently the rack stays in its elevated position while the track gang replaces ties or does similar work.

The removal of the jack is quickly effected when a train approaches by bearing down on the lever bar slightly. This lifts the rack and allows the pawl to fly

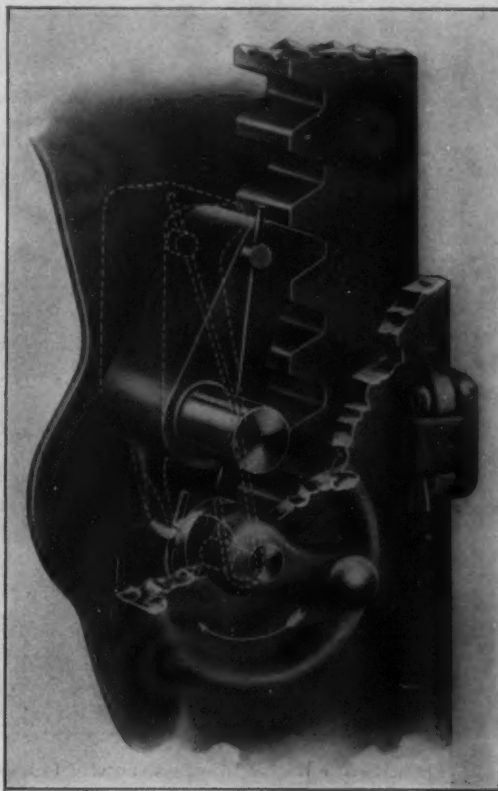


Fig. 2.—Lifting Mechanism of the Jack, Showing the Retaining Pawl and Spring in the Lifting and Releasing Positions.

out and assume the position indicated by the dotted lines in Fig. 2. The load then forces the rack down and the operating lever rises. As this takes place the pinion rolls smoothly out of mesh and the rail drops. Should the small crank for any reason not be turned to the release position when the load is raised, the jack can be quickly tripped by pressing the foot against the lug on the bottom of the pawl and forcing the latter out of contact with the lifting bar teeth.

Old Age Pensions from a Massachusetts Viewpoint.

In 1907 a Commission on Old Age Pensions was appointed in Massachusetts to study the various systems devised in other countries and in use among industrial and railroad corporations. Its report in a volume of 500 pages has lately been published. From a summary printed in the *Boston Transcript* the inference is drawn that its work has been thorough and valuable.

The committee came out strongly against any scheme of noncontributing old age pensions, such as the one lately introduced in Great Britain. This it condemns on the score of expense, of discouragement of thrift, of a disintegrating effect upon the family, and of an unfavorable influence upon the rate of wages. Yet a plan of contributory retiring pensions for public employees, including those of towns and cities, is emphatically recommended by the committee, and the scheme of retiring allowances for aged workmen is urged upon large employers of labor, the whole to be based squarely upon the contributory principle. In line with this vigorous and wholesome assertion of the duty of self-reliance, is the recommendation that "thrift should be included among the subjects of compulsory instruction in the public schools."

A New Sturtevant Generator Set.

The generator set shown in the illustration embodies the new type single vertical engine known as Class VS-7 of its builder, the B. F. Sturtevant Company,

mechanism completely inclosed within the frame, which is provided with openings having easily removable dust-proof covers through the front, back and sides of sufficient size to permit of easy access for inspecting or adjusting. An important feature is a watershed partition

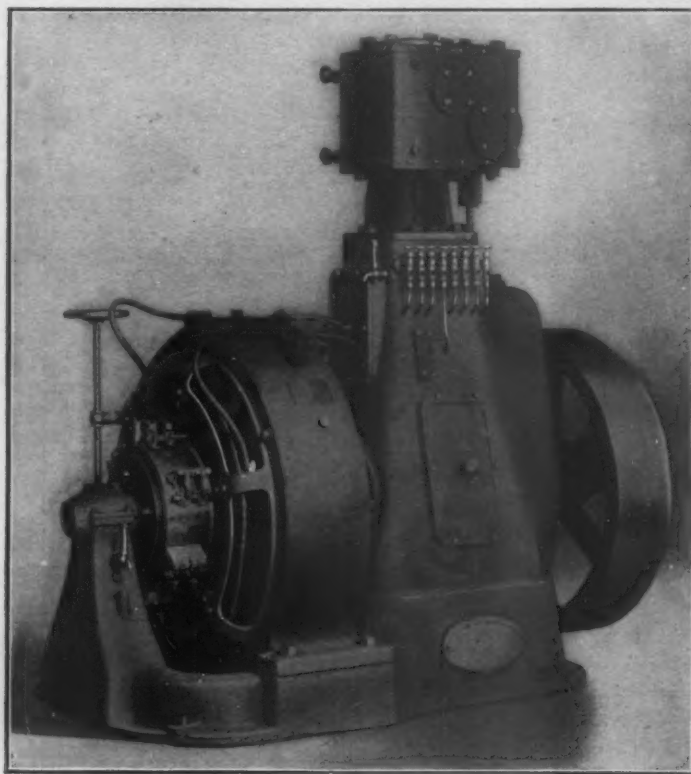


Fig. 1.—The Engine Directly Connected to a Generator.

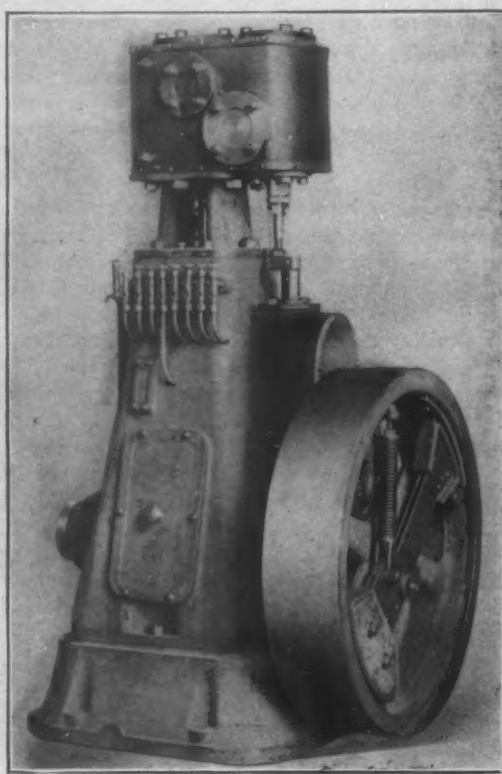


Fig. 2.—Another View of the Engine.

The New Class VS-7 Single Vertical Engine Built by the B. F. Sturtevant Company, Hyde Park, Mass.

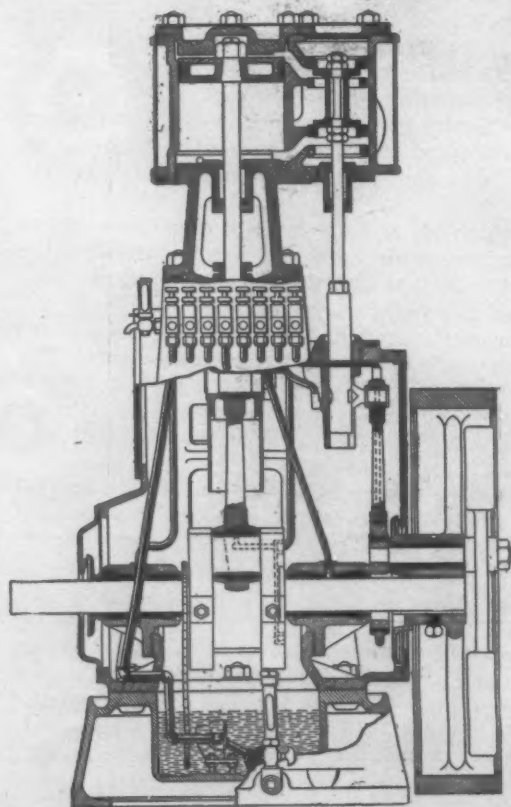
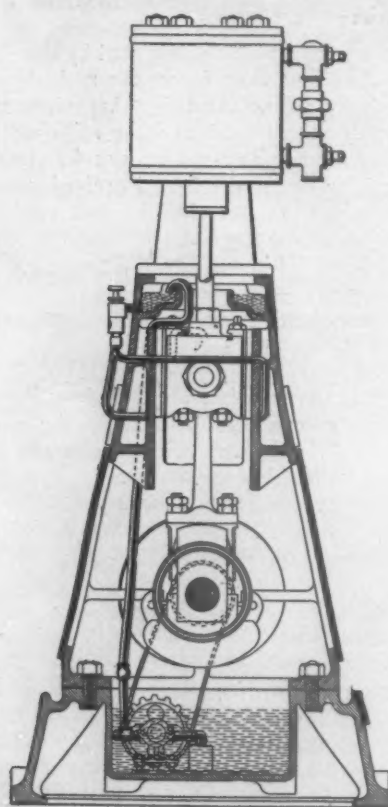


Fig. 3.—Sectional Elevations of the New Sturtevant Class VS-7 Engine.

Hyde Park, Mass. Although in general design it resembles earlier models, the engine embodies many refinements of detail, including an improved lubricating system and greater accessibility of the inclosed parts. It is of the high speed type, with all reciprocating

which prevents the oil from the frame being carried into the cylinder and the water from the cylinder being carried into the frame. This partition, together with the piston rod stuffing box, is located in a distance piece which separates the cylinder from the frame, and which

has openings giving convenient access to these parts even while the engine is in operation. Fig. 1 shows the generator set complete, Fig. 2 another view of the engine, and Fig. 3 details of construction and of the lubricating system.

The lubricating system of the gravity type consists of a reservoir cast in the top of the frame from which the oil flows to all bearings through piping equipped with sight feeds. All the oil not used flows into a reservoir cast in the sub-base, where it is filtered through fine screens and forced to the top reservoir by a durable

Woodlawn Works from the Allis-Chalmers Company, Milwaukee, Wis. This will be of the horizontal cross compound condensing type and have cylinders 48 and 84 in. by 60 in. stroke. The main shaft will be extended on each end and connected directly to the rolls.

The Baird Wire Forming and Ferruling Machine.

Like the wire forming and stamping machine described in *The Iron Age*, January 6, 1910, made by the

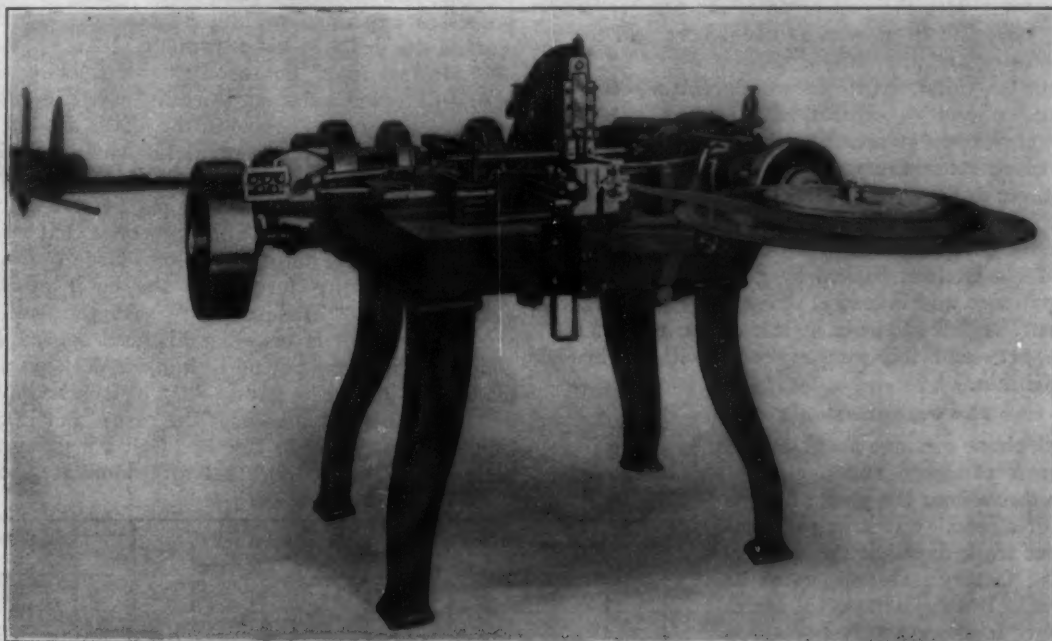


Fig. 1.—A Special Wire Forming and Ferruling Machine Built by the Baird Machine Company, Oakville, Conn.

efficient pump which is entirely submerged in the oil. The engine may be run independently of the oil pump by filling the top reservoir through an opening provided in the frame and drawing off the excess oil from the bottom reservoir through a drain cock.

A Rites inertia governor placed in the balance wheel regulates the speed so accurately that the variation between no load and full load is not more than 1½ per cent.

The generating sets are built in sizes from 7½ to 50 kw., and are made up of a generator of either the six or eight pole type directly connected upon the same sub-base of the engine.

The generator armature is of the two circuit ventilated drum type and is pressed upon the shaft. The armature coils are form wound and are thoroughly protected against oil and water. The commutator is made up of segments of hard drawn copper insulated with amber mica of such hardness that it will wear uniformly with the copper. These segments are secured in a steel ring and insulated therefrom by rings of hard mica. Armature conductors, commutator segments and brushes are proportioned to give low current density to insure low temperature rise, high efficiency and good operation. The brush rigging is arranged so that the brushes may be adjusted simultaneously by revolving the brush ring. The magnet frame is of cast iron, and is divided on a horizontal plane. The pole pieces are of wrought iron, and together with cast iron shoes, are through bolted to the frame. The field coils are made up in two sections, the compound winding forming one section and the shunt winding the other section. They are machine wound and of open construction to secure maximum radiation and ventilation.

The Jones & Laughlin Steel Company, Pittsburgh, Pa., has recently ordered a new mill engine for its

Baird Machine Company, Oakville, Conn., the one illustrated in Fig. 1 herewith, was the outcome of a demand for means to manufacture such articles as suspender loops, buckles, easel stands, &c., of which Fig. 2 is an example.

This machine is a combination of two machines and is entirely automatic in its action, as it will take wire from the coil, straighten, feed, cut off and form it, and take sheet metal from a reel, cut off, form and attach a

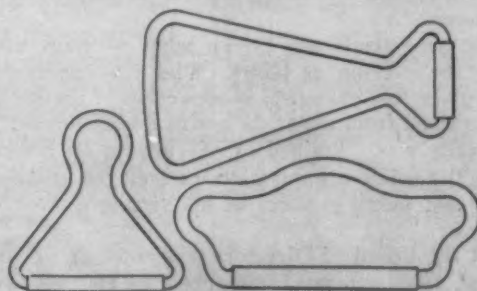


Fig. 2.—Examples of the Products of the Machine Shown in Fig. 1.

ferrule made from it around the wire form as described above, dropping the complete ferruled wire forms into a receptacle at the rate of from 60 to 80 per minute, according to the size and shape. No attention is required other than keeping the machine supplied with metal and wire and removing the finished goods.

All cam linings, rolls and pins subject to trying service are of tool steel, hardened and ground, and all sliding surfaces are hand scraped to a bearing.

The machine is built in several sizes adapted for the variation in styles of work for which it was designed, and is proving quite popular among novelty manufacturers.

A Code of Efficiency.

How a "One Man" Organization, Left Suddenly Without Its Leader,alters—How, Under a New Leadership, it Picks Up Its Stride and Runs a Stronger Race than Ever.

BY CONNECTICUT.

The "old man" was gone. Yet only last week his tall figure, erect with the just pride of his 65 energetic, well-run years, had been seen as usual here and there in the factories and the offices.

His master mind, with its wonderful powers of comprehension and concentration, was felt in every part of the works. It seemed as if nothing was too complicated or extensive in scope for him to understand at once; nothing too trivial to be without instant interest to him. The Bancroft Mfg. Company, with its extensive shops and world-wide trade, was the product of his intellect backed by grim energy and by untiring patience and industry. Conqueror of markets and of men, he fell suddenly at last at the will of the Great Reaper—and the company was without head, heart and brain.

The Organization Totters.

The telephone message that December morning from the Bancroft residence announcing his death affected every one throughout the plant; he was that sort of a man. But it was not until the next work day that the full extent of the factory's loss began to be appreciated. Booth, Bancroft's secretary, realized it among the first—he was talking on the telephone with the sales department.

"I'll be up in half an hour to talk over changing the production schedule on those alternators," the sales manager had told him and hung up. Turning to the work on his desk, Booth stopped short and half rose from his chair; piece by piece, comprehension of what it all meant came to him. Bancroft gone, how about the hundred and one details his superior had been in the habit of deciding for himself? Helplessness and a chilling indecision crept over him; he faltered.

The same truth was driven home to many another during the ensuing 24 hours. The atmosphere of the whole place had changed; it seemed as if the prop had been knocked from under the entire establishment. And so it really was. Trained to rely always on Bancroft's say-so, the whole organization tottered the moment the mental and moral support of his virtual presence was removed.

But the Board of Directors was not long in convening, and, as an outcome, announced the election of John Eldredge as general manager to succeed the deceased proprietor. The news spread rapidly through the shop.

"Who is this Eldredge?" clamored several foremen of Booth when next he showed himself in the shops.

"Son-in-law of Mr. Bancroft; married his youngest daughter, I believe," he told them. "He's a professional accountant; audited our books last January."

Indignation preceded anxiety on the faces of his hearers at this news; protest was violent from many of the more outspoken.

Taking Orders from a Bookkeeper.

"It's come to a pretty pass when we have to take our orders from a bookkeeper," exploded Smithson, foreman of Section M.

"We may as well look for jobs elsewhere," Lines, foreman of instrument makers, spoke despondently,

"for the shops will go straight to pot now. Don't know as I care much either, with the old man gone."

Storm centers such as this gathered fast, and on the following morning when Eldredge took hold the discontent was as widespread as was the sorrow over Bancroft's death.

A morning which Eldredge spent in the shops, with Booth at his side, did much to overcome the prejudice which had sprung up against him, for in addition to his natural adaptability to the calling of accountant he fortunately possessed a rather sound knowledge of mechanics, and his ready grasp of several manufacturing processes explained to him by some of the foremen worked decidedly to his advantage.

"He's no fool," Smithson admitted during the noon hour—Eldredge had spent some little time in Section M.

Succeeding days passed in the offices and shops gave the new manager the general knowledge of the shop layout and system that he required, and he went back to his desk to get the necessary perspective his position demanded. He had seen almost at once that Bancroft's custom of mixing into all matters, large or small, had trained the entire force into the habit of referring everything to "headquarters." At the end of the second day spent in his office his head buzzed with the countless questions put up to him for decision after the manner of his predecessor. At 5 o'clock he gave it up.

"This is sheer nonsense," he rasped out in desperation. Then turning to Booth, "Call a meeting of foremen and assistants for this afternoon at 5.30. This

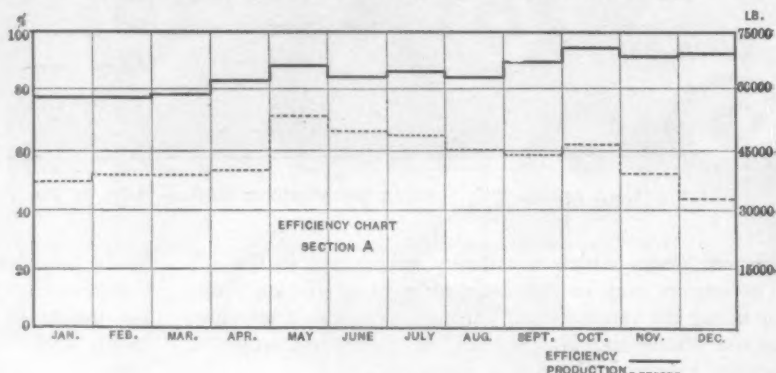


Fig. 1.

can't go on any longer." Clearing the office he strove to collect himself and to gather his muddled thoughts for the coming meeting. The half hour seemed very short; before he knew it the time was up and he faced his men. He saw many stolid faces among them.

Responsibility Is Thrown on Foremen.

"I know all you men realize fully the loss Mr. Bancroft's death means to the factory"—he struck boldly into the subject, neither wasting words nor dodging the issue—"and I can safely say that none of you realize it more clearly than I do myself. He was a wonderful man and our superior in all respects. On his shoulders he carried the burdens of the whole works; to him you all went for advice and suggestion, and from him you all received the answer you went after." He paused; several older heads nodded in affirmation.

"But now that he is gone," Eldredge was very earnest, "now that he can no longer give us the help we have learned to expect from him, we must take up these burdens ourselves and push on. It will not be easy for any of us; but let's pull together; let's go at it shoulder to shoulder, men, and we'll win out."

"If I can help any of you, come to me freely. I am sure I shall require a great deal of help from every one of you." His smile brought an answer from many, and the good feeling seemed to spread as he unfolded his plan. "Commencing to-day," he explained, "every one of you men will have to bear his share in the re-

sponsibility. I shall choose a certain line of work for each one of you, the line in which each is most expert, and hold you responsible for the successful accomplishment of the duties connected with your distinct lines."

Eldredge went further into detail in answer to the questions and protests which were raised. But on the whole the idea took firm room from the start; especially among the more progressive sprang up a keen anticipation, an impatience to "try their wings."

"Remember one thing," he urged as they rose to file out, "we've got to succeed, for it means our bread and butter; it means food and clothes for our little ones. We mustn't fail!"

Minor Details Go to Subordinates.

As rapidly as compatible with cautious good judgment Eldredge chose his men and allotted them their responsibilities. The scheme called for some little reclassification of work and machinery, so that the grouping might be more in line with the several foremen's specific class of product.

Once he had picked his man and explained what was to be expected, Eldredge unloaded upon him his allotment of duties, so that in a short time Booth was able to handle all minor matters direct with the foremen, leaving his superior to take up the more vital questions in a clear-headed manner. One morning, a few weeks after the foremen's meeting, Booth approached his manager's desk.

"Do you think it wise to leave so much to the

both large and small, were "speeding up," both in production and in the practice of economy. (See Figs. 1 and 2.)

And now he had before him in one comprehensive statement the efficiency record for each department for the year. More than that, under his direction, Booth had prepared a separate chart for each section, the better to illustrate the fluctuations as they occurred. For example, he saw that Section A had increased from a factor of 78 in January to a factor of 93 in December. Such had been the profitable result of throwing upon the shop foremen some share of the total responsibility which Bancroft had previously borne for them—and each man had answered the call. Eldredge confidently expected continued rising efficiency in the new year that had just opened.

Discouraging Results Show Something Yet Needed.

But it proved a premature counting of poultry. February 1 brought him a decidedly discouraging array of ratios. "There is some mistake here," he scowled at Booth, indicating the efficiency factors for January. "Better go over the figures again," his manner voicing an uneasy annoyance.

"I noticed the drop in those ratios," answered Booth quietly. "The figures are correct, however."

Intently studying the tables and charts Eldredge turned slowly to his desk; in no case was the efficiency for January as high as it had been in any one of the three preceding months. Chagrin at this apparent failure

DEPARTMENT EFFICIENCY FACTORS																							
SECTION		JAN.		FEB.		MAR.		APR.		MAY		JUN.		JUL.		AUG.		SEP.		OCT.		NOV.	
		100	%	100	%	100	%	100	%	100	%	100	%	100	%	100	%	100	%	100	%	100	%
A	OUTPUT	87000		91000		96000		106400		114000		120000		126000		131000		136000		141000		146000	
	EXPENSE	476 00	78	480 00	78	480 00	78	480 00	78	480 00	78	480 00	78	480 00	78	480 00	78	480 00	78	480 00	78	480 00	78
B	OUTPUT	71400		72000		72000		72000		72000		72000		72000		72000		72000		72000		72000	
	EXPENSE	467 00	80	467 00	80	467 00	80	467 00	80	467 00	80	467 00	80	467 00	80	467 00	80	467 00	80	467 00	80	467 00	80
C	OUTPUT	100000		100000		100000		100000		100000		100000		100000		100000		100000		100000		100000	
	EXPENSE	100000	100	100000	100	100000	100	100000	100	100000	100	100000	100	100000	100	100000	100	100000	100	100000	100	100000	100

Fig. 2.

foremen?" he asked seriously. "It may be because I have been used to Mr. Bancroft's way of doing things, but it seems to me now as if before we are through the foremen will be running the shop."

Looking up quickly the assurance of perfect well-meaning on his secretary's part drove the frown from Eldredge's face. "Your fears are perhaps natural, but they are entirely unfounded," he answered, drawing forward a sheet he had been studying. "Here is my grip on the foremen," he went on. "This is the first step in my Code of Efficiency. By means of this sheet I hope to get in closer touch with the affairs of the shop than Mr. Bancroft ever did."

Booth studied the sheet intently, enthusiasm gradually displacing the absorption on his features. "Splendid!" burst from him at last. "You will measure each foreman's efficiency by the ratio between the production or output and his expenses." "Exactly," agreed the other, reaching for a scratch-pad and writing rapidly:

$$\text{Producers. Factor of efficiency} = \frac{\text{Output}}{\text{Wages.}}$$

$$\text{Foreman. Factor of efficiency} = \frac{\text{Room output}}{\text{Room expenses (total).}}$$

"That is the basis of my system, of my code. This sheet is the first month's record. By means of these sheets I shall watch the shop progress, or," he added, smiling, "perhaps, retrogress."

The Year End Brings Premature Confidence.

Came the new year. Twelve months of gratifying activity for the Bancroft Mfg. Company had marked Eldredge's first term of management. The monthly efficiency statements had indicated to him a gradually improving set of conditions in the shop; the members,

of a theory which had seemed to vindicate itself so gratifyingly, and a determination to go to the seat of the trouble, drew lines of concentration and dogged purpose on his strong face. During all his working hours and in the evenings the unsolved problem hung over him; at times its solution kept him wakeful far into the night. Yet the figures for February were equally disheartening.

The suggestion that perhaps the maximum had been reached he put aside as without foundation; surely the maximum efficiency could not be reached in one short year. Nor was it probable that his men had lost anything in energy or in ability. They had run a good race; they had speed; it could not be that they lacked staying power. Rack his brain as he would no hint of probable causes came to his help. He felt himself groping, and each day he seemed to be groping more blindly.

But at the last it came to him like a flash; so suddenly, so vividly that he laughed—laughed at himself for coming so often close to the solution yet missing it by an arm's length. For he saw it all when he one day experimentally put himself in the place of any of his foremen; when he imagined himself at their desks harassed by their troubles, inspired by their ambitions.

An Incentive Is Provided.

"I've got it," he called out to Booth. "I haven't developed my theory far enough. No system for measuring efficiency is of value unless you first have some means of increasing such efficiency. That is where I fell short; I have not provided any incentive."

"But the efficiency increased right through last year," argued Booth.

"That was instinctive; that was a natural desire to

excel, to make good—and they did make good," Eldredge answered heartily.

"But this year," he continued rapidly, "this year what does a foreman or any of the workmen say to himself? He asks himself, 'why work half as hard again to make more money for the firm when I don't get anything out of it myself?' So one of his New Year's resolutions was to lower his speed. I'm going to add an amendment to my Code of Efficiency, an amendment rewarding increase in efficiency. I'm going to make it worth their while to speed up; they're just as human as the rest of us. They need inducement, incentive, and they shall have it."

The development of his amendment proved it a less simple matter than had at first appeared. His chessmen being human each move was a separate problem, no one rule sufficing for all. He rewarded all his foremen who had made good records in accordance with what such records, coupled with good judgment, would dictate. And he allowed the producers a certain maximum wage rate per day, with the understanding that they share half and half with the company all wages above this rate earned by the expenditure of extra effort on their part. This was his first step, and, though slight modifications were made in specific cases, his charts for succeeding months amply proved his theory.

"Booth," he said one day some months later, "the thing works so well I'm tempted to try it on myself," and he laughed good-naturedly.

"How's that?" asked the other. Eldredge's pencil wrote a third formula in scrawling, hurried figures:

$$\text{Manager. Factor of efficiency} = \frac{\text{Factory output.}}{\text{Factory expenses.}}$$

"Don't you think that would be carrying the thing too far?" asked Booth when he had finished reading.

"Not at all," Eldredge spoke earnestly, "what is fair for one is fair for all," and he fell into a silence of abstraction while his eyes widened under the spell which this new thought cast over him.

Smiling faintly Booth turned back to his work; he knew his employer well enough now to feel sure that before many days had passed the novel suggestion would bear fruit—and good fruit, too.

A Novel Rockford Drill with Geared Tapper.

The 14-in. drill built by the Rockford Drilling Machine Company, Rockford, Ill., shown in the accompanying engraving, possesses constructional features that are somewhat novel. The drill is equipped with the patented geared tapping device of the manufacturer and is arranged for power feed. The greatest interest centers around the spindle, which is equipped with a six-spindle auxiliary drilling head. It will be noticed from the illustration that the separate spindles are driven through gears in the head, which mesh with a gear on the lower end of the main spindle instead of through arms with universal joints engaging with one large gear wheel. Another feature is the capacity to drill or tap six holes at the same time.

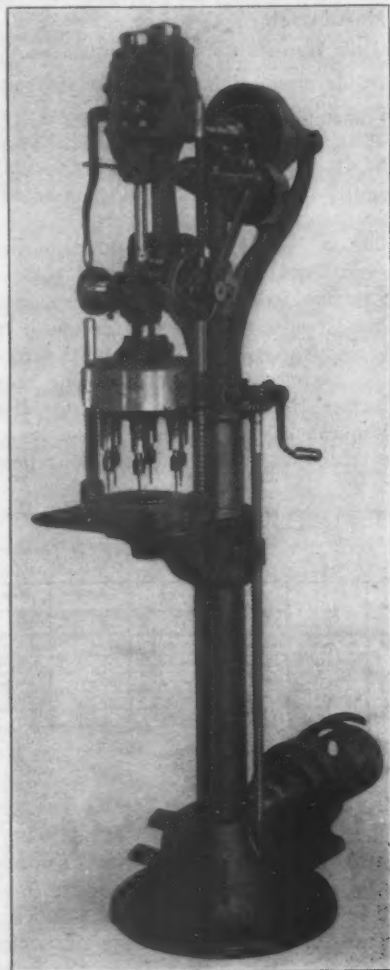
This drill is designed to bore $54 \frac{1}{8}$ -in. holes spaced at equal distances around the circumference of a 6-in. circle in the piece held in the drilling jig. As only six holes are drilled at a time it is necessary to shift the work nine times to perform the complete operation, and this is accomplished by providing the jig with a spacer that moves it forward through an arc of 40 degrees after each set of holes is made.

When the drilling operation has been completed on the required number of pieces, the drills are removed from the chuck and taps substituted, while the drilling jig is replaced by the tapping jig. In this way six holes are tapped at a time by the patent geared tapping attachment.

The jig has two upright guides which are provid-

ed with coil springs, having tension enough to counterbalance the weight of the auxiliary head and permit it to return quickly when the spindle is reversed. The tapping jig is the one shown in the illustration and not the drilling jig.

The drill is belt driven and has a pedal start and stop. A cone pulley transmits the power from the countershaft to the shaft at the top of the machine and affords five changes of speed. The next to the slowest speed is used for tapping, and it is stated that the 54 holes can be tapped in an average time of 50 sec.



A 14-In. Drill with Geared Attachment for Tapping Six Holes Simultaneously, Built by the Rockford Drilling Machine Company, Rockford, Ill.

For drilling the fastest speed is employed and the drills are driven at a high rate of revolution.

The Susquehanna Smelting Company, Lockport, N. Y., has decided to close its plant in that city because of the continued low prices obtainable for its electrically smelted products and difficulties in regard to obtaining an extension of lease for its present plant, which is owned by the Holly Mfg. Company, Buffalo. Vice-President H. C. Harrison states that when the company went to Lockport from Philadelphia two years ago it expected cheap electric power and low freight rates, which it has not received, and, despite the higher tariff on competing foreign products established last year, prices dropped, and have remained so low that the company has of late operated at a loss. The plant is one of the largest in Lockport, and has been the most extensive user of electric power.

The Falls Machine Company, Sheboygan Falls, Wis., has contracted for considerable new machinery, which will be installed within the next few months. The company has taken a contract for building a large number of gasoline motors, which made necessary the increased capacity.

Locke Engine Stop for Small Units.

The automatic engine stop manufactured by the Locke Regulator Company, Salem, Mass., and shown in the accompanying illustrations, is designed for the protection of small engines and steam turbines having supply pipes of $3\frac{1}{2}$ in. in diameter or less. The principle of operation is similar to that employed in the stop for large engines illustrated and described in *The Iron Age* October 26, 1905; any excess of a predetermined speed causes the instantaneous cutting off of the steam supply to the engine. If from any cause, such as the breaking of the belt, the speed of the main shaft exceeds that limit, an electric circuit is closed and the automatic throttle causes the engine to slow down immediately from lack of steam, thereby guarding against the bursting of the flywheel, which might follow with a runaway engine.

The specially constructed valve, illustrated in Fig. 1, has an independent control from the main shaft of the engine, which drives a centrifugal governor so designed that an excessive speed causes a magnet coil to be energized and releases a plunger which, though quick to perform its function, is uninfluenced by vibration. The valve is usually fastened direct to the throttle valve, but it may be installed at any convenient point and provided with a bonnet and handwheel for use as a combined throttle valve and automatic engine stop which is the type shown in section in Fig. 2.

The valve construction is clearly shown in that drawing. The steam enters, as indicated by the arrow, and forces open the disk *a*. It also passes through the small ports *b* in the center of the disk, filling the air

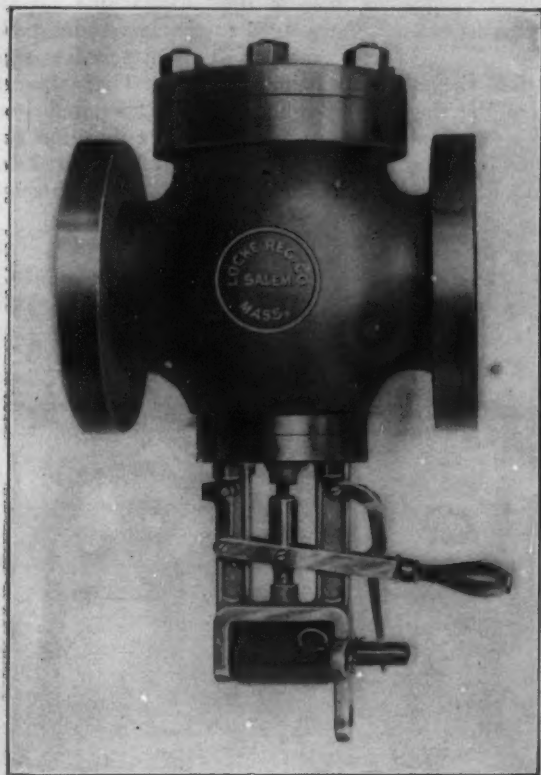


Fig. 1.—A Special Valve for Automatically Stopping Engines, Made by the Locke Regulator Company, Salem, Mass.

space at *c* back of it and thus balancing it, the pressure causing the throttle to open. The steam also passes the smaller closing piston *d*, the diameter of which is about 1-64 in. less than that of its cylinder, *f*. This cylinder is controlled by the auxiliary valve *e*, which is the medium through which the speed limit device works.

When the magnet coil is energized by the action of the centrifugal governor, the plunger *g* strikes a hammer blow, which releases the retaining latch *h* from the

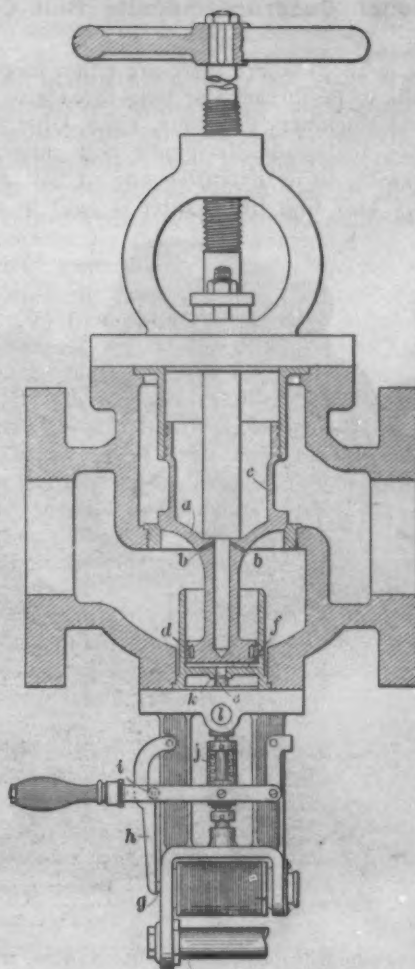


Fig. 2.—Sectional View Showing Details of Construction of the Locke Combination Throttle Valve and Automatic Engine Stop.

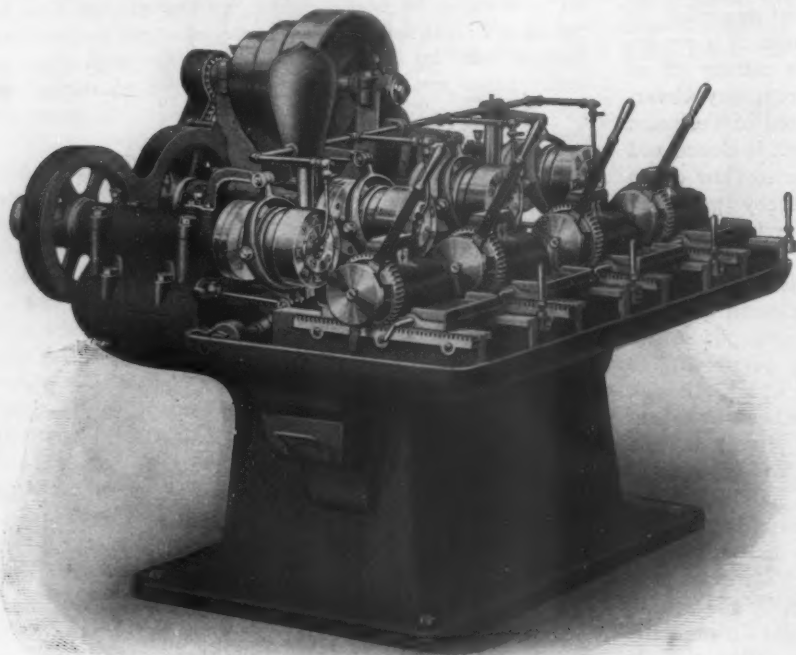
roll *i*, thus removing the pressure of the spring *j*, which holds the valve *e* to its seat. The steam pressure in the chamber *f* forces open the valve *e*, exhausting the pressure from that chamber through the small port *k* to the atmosphere at *l*, from which a $\frac{3}{4}$ -in. exhaust pipe leads to the hot well or other draining apparatus. The main valve is thrown out of balance, permitting the pressure to close the disk and shut off the steam supply. The only subsequent adjustment is to latch the electric valve, which serves to equalize the pressure in the cylinders again and forces the throttle open.

Hamilton Engines in the Pittsburgh District.—The Hooven-Owens-Rentschler Company reports through S. H. Wheelhouse, its Pittsburgh sales representative, that the 42 and 78 x 60 in. Hamilton-Corliss tandem compound condensing engine of 4000 nominal hp., built for direct connection to the new 22-in. mill at the Clairton plant of the Carnegie Steel Company, was delivered complete January 11, and that assembling was commenced at once, so that on January 26 the first I-beam was rolled, which makes a record for erecting and starting. This is the first Hamilton mill engine to be installed in the Pittsburgh District having the latest improved gravity gear. Its weight is 800,000 lb. Other shipments recently made include a 600-kw. direct connected outfit for the Parkersburg, Marietta & Interurban Street Railway Company, Marietta, Ohio, and a belted simple engine to the R. Thomas & Sons Company, Lisbon, Ohio.

Concerning the report that the Burden Iron Company will build a new blast furnace at Troy, N. Y., the company states that no definite decision on the matter has been reached.

The National Quadruple-Spindle Bolt Cutter.

For use in shops where there are either large numbers of bolts to be threaded or long threads to be cut the National Machinery Company, Tiffin, Ohio, has recently added the quadruple-spindle bolt cutter, illustrated herewith, to its extensive line of bolt and nut machinery. This four head cutter is built in a num-



A Four-Spindle Bolt Cutter Built by the National Machinery Company, Tiffin, Ohio.

ber of different sizes and is of the same general construction as the other cutters of the National standard opening-die type.

This machine is equipped with the same patented single lever vise and carriage movement as the double and triple head bolt cutters of this manufacturer. In this way it is possible for the machinist to control the movement of the carriage in either direction, and to open and close the vise by a single lever operated with the left hand, while the right is left free for placing the pieces in the vise or removing them after the threading operation is completed.

The die heads are compact and self-contained, and it is stated can be fed as easily by one man without any loss of time as two single or double spindle cutters. The interchangeable case dies of the manufacturer are used in the heads and are held in position by a self-contained locking device which makes the head practically one solid die when closed and insures accurately cut threads.

Three changes of speed are provided for by the cone pulley located on top of the machine. Some of the advantages of this position are a reduction in the amount of floor space required, supports for the shaft at both ends and grease and chips kept from the belt, with a consequent lessening of slip. Automatic and hand opening and closing devices are provided for each of the heads which can be run either in unison or separately. Lubrication is obtained from a force feed pump with an adjustable stroke to vary the flow of the lubricant.

The next meeting of the American Institute of Mining Engineers will be held at Pittsburgh, March 1 to 5, inclusive. A local committee is preparing a programme of trips to various industries and the list of papers to be read and discussed will be sent out from the office of the secretary of the institute about February 15.

New Leffler Bar Folders.

Wooden packages are at present being rapidly replaced by metal packages for many good reasons, and the cheap manufacture of metal drums is receiving earnest attention in many places. Packages of considerable capacity are now being made for holding oils, paints and various liquid and solidified compounds.

These packages are usually pieced, the bodies being made with a lock seam and the heads with a double seam. The turning of the hooks for the seam is an awkward operation if done in an ordinary folder, as it necessitates the entire sheet being thrown over the machine. The bar folders shown herewith are a new line recently designed by Charles Leffler & Co., 49 Clymer street, Brooklyn, N. Y., to facilitate the handling of large sheets, and are called inverted folders, because the construction is opposite to that of the usual folder, the sheet being held while only the edge is turned. The views shown are from the front of the machines.

Fig. 1 is a 36-in. hand machine which will handle sheets 36 in. wide and turn a hook from $\frac{3}{8}$ to 1 in. wide. The back of the machine is arranged so that a wooden table may be easily attached to support the sheets while being worked. The trimmed edge of the sheet is brought up to the tempered steel gauges shown at the front opening of the machine, and the turning of the large hand wheel first brings down the cross bar to clamp the sheet, and then, through



Fig. 1.—A 36-In. Hand Inverted Bar Folder Made by Chas. Leffler & Co., Brooklyn, N. Y.

gear segments on the right of the machine, rotates the flywheel until it is home. The cross bar is brought down with cams and holds the sheet securely while it is being turned. After the hook is formed the fly bar drops and the cross bar rises sufficiently to permit the work to be drawn out. Adjustment for various thicknesses of metal is made by setting the nuts and lock nuts at the ends of the cross bar. Adjustment of the gauges is made simultaneously through the small hand wheel

at the back of the machine, and an arrangement for locking them is provided. A variety of hooks may be obtained by changing the shape of the steel edges on the bars. The machine will handle sheets up to No. 22 gauge in thickness.

Fig. 2 is a 36-in. power machine of the same capacity as the hand machine. The operation of the working parts is the same as in the hand machine, but all the movements are automatic. The operator sim-

thickness. It will turn accurately an edge from $\frac{1}{4}$ to $1\frac{1}{2}$ in. wide. The fly bar is driven at both ends by segments and pinions. The double back gearing gives a powerful motion for turning the edge. The motion of the machine is also controlled by a positive clutch.

The wide range in work that is permitted on all these machines makes them a valuable addition to any plant that manufactures pieced articles in quantity. All the adjustments are quickly and easily made, and

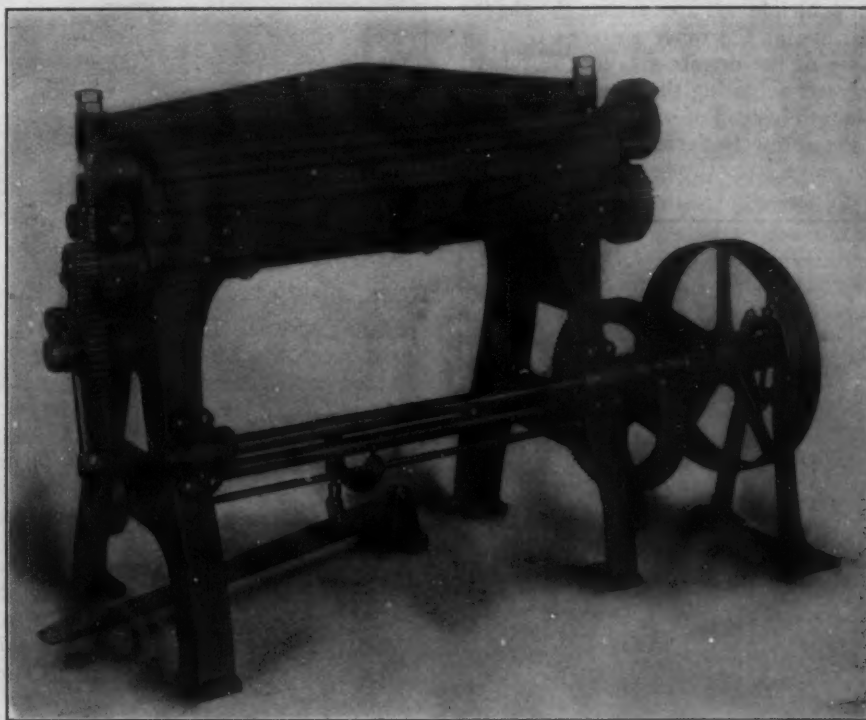


Fig. 2.—A 36-In. Leffler Power Bar Folder.

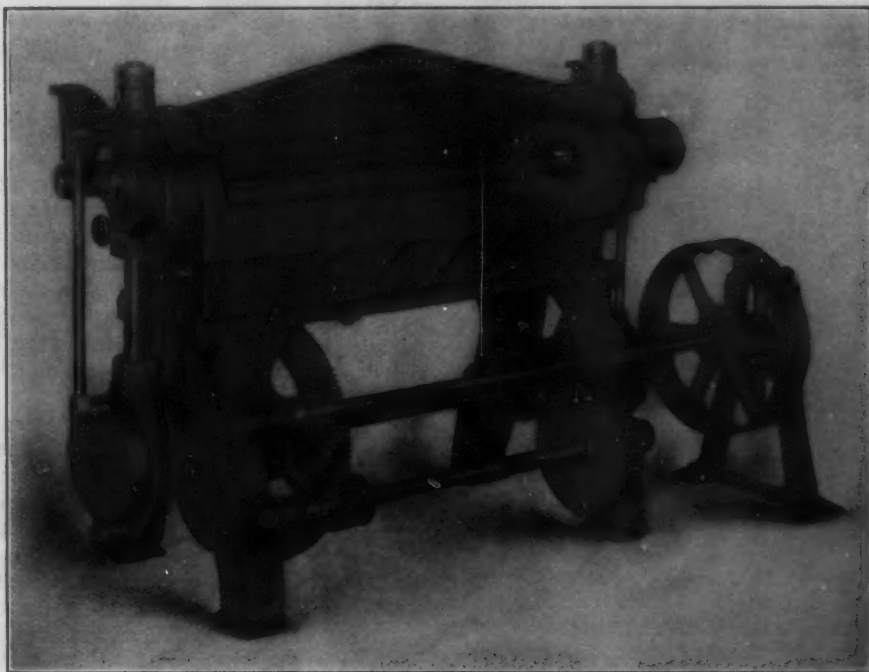


Fig. 3.—A 42-In. Leffler Power Bar Folder.

ply feeds the sheets and presses the treadle. The cross bar and fly bar are driven through segments and pinions from a rocking shaft, which is oscillated by a crank. The motion is controlled by a positive clutch which permits the folding bar to turn once and stop, ready for the next sheet. The back gear gives a steady, powerful motion to the machine and permits the turning of short edges.

The machine shown in Fig. 3 is a powerful folder taking sheets 42 in. wide and up to No. 18 gauge in

the handling of material is reduced to a minimum. The operation of the machines is rapid and the work is accurate, but of special advantage is the convenience and ease with which the work may be done.

J. B. Taylor & Co., Inc., engineers and contractors, have removed from the Hudson Terminal Building to 37 Liberty street, New York, where they occupy Suite 601-604.

The Oneida Steel Reinforced Independent Lathe Chuck.

To meet the situation which has arisen as the result of the general introduction of more powerful lathes to keep pace with the improvements in tool steel without a corresponding strengthening of the lathe chucks, the Oneida National Chuck Company, Oneida, N. Y., has brought out and patented its steel reinforced independent lathe chuck. In principle and appearance the chucks are practically the same as the other patterns now on the market, but some of the details are very different. For example, the screws actuating the jaws are threaded for their entire length instead of omitting the threads near each end of the screw to form a bearing. This permits the jaws to move from the center of the chuck

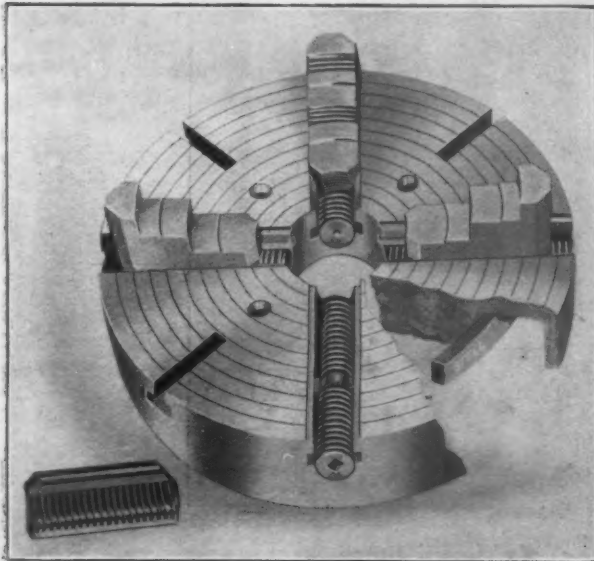


Fig. 1.—Broken View Showing the Steel Reinforcing Ring in the New Independent Jaw Lathe Chuck Made by the Oneida National Chuck Company, Oneida, N. Y.

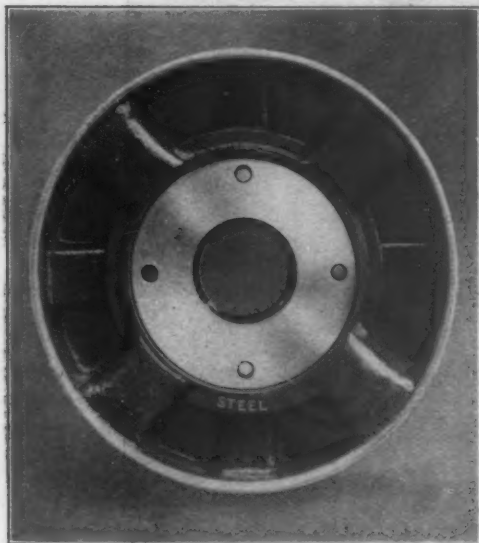


Fig. 2.—The Back of the Oneida Steel Reinforced Lathe Chuck.

to the extreme outer edge without coming off the thread, a feature that adds somewhat to the capacity of the chuck and makes it stronger and more durable.

The construction and appearance of the chuck may be clearly seen from the accompanying illustrations. Fig. 1 shows the front view of the chuck with a part of the body removed, and gives an idea of how the solid steel reinforcing ring is firmly cast in the body and forms a portion thereof. Another view, Fig. 2, illustrates the back and the way in which the central portion of the body is encircled by the steel ring which passes through the heavy portions of the body and is

embodied therein. The sectional view, Fig. 3, shows how the ring forms a bearing for the operating screws and receives the stress of the end thrust instead of the body.

This chuck is a combination of a cast iron body with tempered and hardened steel operating screws and jaws. This is reinforced by a solid forged steel ring which is

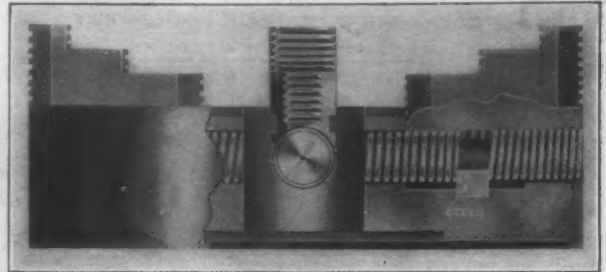


Fig. 3.—Sectional View, Showing One of the Operating Screws.

cast in the body and forms four center bearings for the operating screws. In this way the ring carries the end thrust when the jaws are tightened to hold the work in place, and in addition to relieving the body of this stress, which is ordinarily transmitted to it, also prevents it from breaking. The reinforcing action of the steel ring and the body are mutual; the steel ring reinforces the body and the body in turn reinforces the steel ring. The two thus form a combination of strength in the body which it is claimed will withstand the stress and strain of the heaviest lathe work.

The construction of the operating screws which are threaded to the extreme end and the location and relative sizes of the center and end bearings are clearly shown in Fig. 3. This, it is stated, gives great strength and capacity. It will also be noticed from this illustration that the jaws are set very deeply into the body of the chucks, which gives them practically as much strength as if the entire body were of steel.

Railroads and Their Wages Schedules.

Railroads covering all the lines east of Chicago and north of the line east of the Chesapeake & Ohio Railroad have begun active negotiations with their trainmen over the question of increased wages, demands for which were made on the general managers of every line January 3. Officials of the various lines have, in the past month, been collecting a mass of data in preparation of a possible contest with their employees and have prepared elaborate charts showing the relative advance or decline in the price of all living commodities as well as railroad material, together with the advances granted in railroad wages.

The railroads' side of the question will be argued along the lines that, together with the cost of living, increases in the prices of railroad material have also been an equally serious factor in the operation of the railroads. Some of these advances in the past 10 years ranged as high as 80 per cent. Fuel has increased 38 per cent.; locomotives, 50 per cent.; box cars, 72 per cent., and bridge timbers, 80 per cent.

In the face of this increased cost of materials and equipment the rates received for transportation have declined, while wages of the employees have without exception steadily risen. From one of the charts plotted by the railroads and which will probably be brought up in the discussions, it is seen, according to the railroads' presentation of the figures, which are taken from official sources, that the ton-mile rate has, since January 1, 1899, declined 14 per cent., while wages of employees has increased from 13 to 37 per cent. The percentages are in every case based on the rate of wage existing January 1, 1899, as 100 per cent., and the rise or decline in later years represents the percentage of the subsequent rates to the one used as a basis.

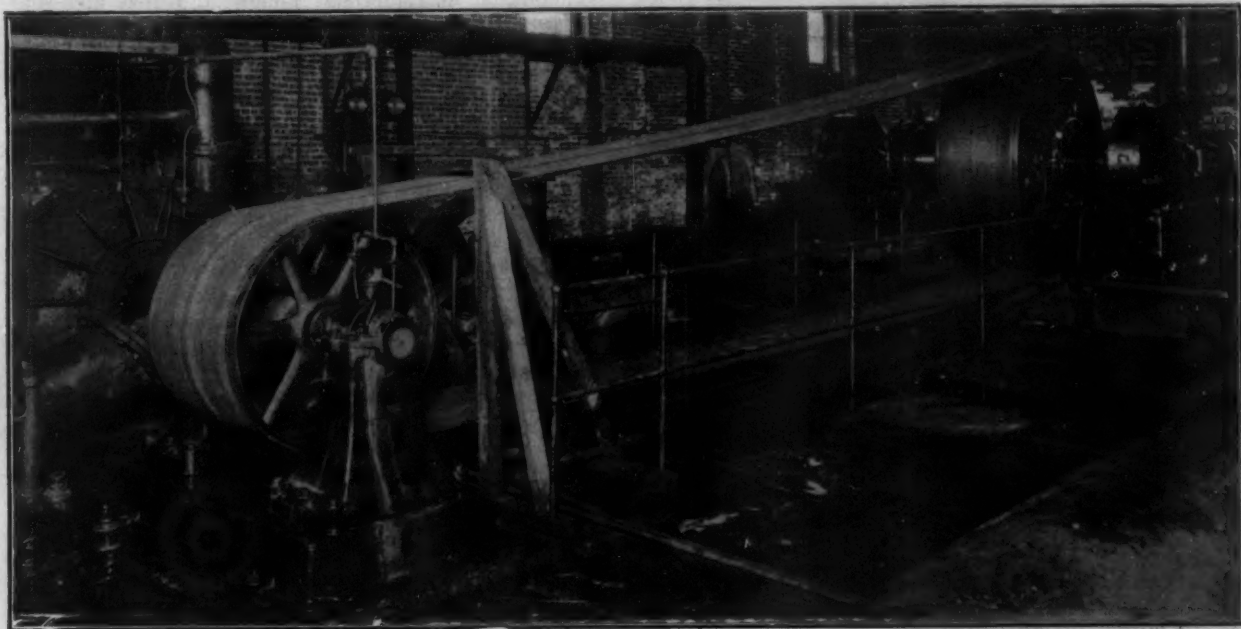
A Large Laminated Leather Belt Drive.

The two important factors in the economical transmission of power by leather belting are the flexibility of the leather forming the belt and the character of its surface. Belts that are hard and stiff either on the surface or in the interior will not make good enough contact with the pulleys to eliminate slipping. The general method of securing a smooth surface is to place the grain or hair side of the leather on the outside in multilap belts and next to the pulley in an ordinary single belt. This part of the leather is the weakest and the one most likely to be affected by improper tanning or to burn when the belt slips. In service the pounding of the surface that is in contact with the pulley face tends to make it hard and brittle, and thus increases the slip. As a result the outside leather burns away and exposes the interior to gradual deterioration.

In a piece of leather the fibers are parallel to the surface for the most part, and the effect upon them

Harrisburg, Pa. The driving and driven pulleys have diameters of 90 and 42 in., respectively, and are located 28 ft. 2 in. apart. A 32-in. three-ply ordinary leather belt reinforced by a 24-in. three-ply rider was first installed to drive the pump. From the start trouble was experienced with the belt stretching because of the varying temperatures and moisture in the plant and the slip of the belt increased until it was found by actual test that the loss of power on this account was more than 20 per cent., and the face of the driven pulley became overheated to such an extent that the pump had to be shut down at various times throughout the day. Belt dressings afforded only temporary relief, and on hot days this would ooze out of the belt and render an all day shutdown necessary while the auxiliary pumps were employed. Finally the plies of the two belts parted, probably because of the excessive moisture in the air, and both had to be shipped to the manufacturer for regluing.

A direct-connected pumping outfit was regarded as the only solution of the difficulty, but before taking



A 28-In. Albeco Belt, Manufactured by the American Laminated Belt Company, New York, Driving a 16,000,000-Gal. Centrifugal Pump.

when brought into side contact with a pulley face is practically the same as that of heavy traffic upon wooden paving blocks laid so that the grain runs parallel to the surface of the street. Placed in this position, the blocks are soon destroyed by the surface splintering off, but if they are placed so that the grain is vertical scarcely any wear is apparent. An ordinary leather belt may be said to represent the first type of block, while a laminated belt corresponds to the other.

These belts, as their name indicates, are made up of a number of strips of equal cross section bound side by side without cement, and arranged so that the cut edge of the leather forms the surface in contact with the pulleys. When so placed the leather, it is claimed, not only has longer life, and is more flexible, but the fibers retain their natural densely interwoven structure and seat themselves more firmly against the surface of the pulley. Thus the slip of the belt is almost entirely eliminated and a greater percentage of the power developed is transmitted.

These contentions appear to be borne out in practice by the experience had at the Standard Oil Company's Eagle plant in Jersey City, N. J., its largest lubricating oil refinery. Here the condenser water was circulated by a 16,000,000-gal. centrifugal pump belt driven from a 500-hp. Fleming-Harrisburg engine built by the Harrisburg Foundry and Machine Works,

out the entire installation an Albeco laminated belt made by the American Laminated Belting Company, New York City, was tried. The belt employed, which is shown in the accompanying illustration, is 28 in. wide and of the equivalent thickness of a three-ply lapped belt. The contrast between the two belts is remarkable. The amount of lost power due to belt slip it is stated is hardly perceptible. When the pump was driven by the old belt it would lose its suction if the steam pressure fell below 85 lb., while with the laminated belt no trouble has been experienced when operating with pressures as low as 65 lb. The laminated belt has a leather cross section of 21 sq. in., and is performing the same amount of work that six plies of leather with nearly double the cross section failed to do. Furthermore it is stated that the belt has never been taken up or required any other attention.

It will be noticed from the illustration that there is a guard of 2 x 4 in. timbers installed near the pump. With the lapped belts this guard had to be used to keep them from going over the side of the driven pulley when the full load was thrown on. Although the far side of the guard was faced with 3 in. of leather, the edge of the lapped belt cut through it clear down to the wood in several months of ordinary running. When the laminated belt was substituted the guard was left in position, as it was thought that it might be needed. So far, however, this has not been

the case, as the belt has not deviated more than $\frac{1}{4}$ in. from its true position on the pulleys, and its even motion has excited much favorable comment.

A Congress of Inventors.

The International Congress of Inventors, which was established in 1906, and incorporated in February, 1907, with headquarters in Rochester, N. Y., is to hold its first convention in that city in June, 1910. An important feature of this convention will be an exposition of the models of recent inventions, and, it is hoped, many curious and interesting models from the Patent Office of industrial devices patented during the earlier part of the last century. It is being planned, also, to familiarize the public with the details of Patent Office work, to represent with a clerical force the *modus operandi* for the entering, examination and the granting of patents to applicants. In other words, there will be an exemplification of Patent Office procedure as an instructive feature of the exposition.

Although the Congress of Inventors has only been in existence since 1906, by the persistent zeal of its organizers it has achieved an international scope, and has in its membership the leading inventors of this and foreign lands. Following are among the objects of the organization:

To endeavor to establish a standing for a United States patent independent of any court action and to obviate the necessity of testing a patent in the courts simply to prove that it has a standing when the Patent Office of the United States has issued it.

To procure legislation or action by the Federal or State governments when needed.

To reform abuses and secure freedom from unlawful and unjust exactions.

To promote intercourse among the members of the association for their mutual interests.

To maintain a headquarters in charge of a secretary, who shall procure data for the use of the members, build up a library, direct members to sources of advice on all matters pertaining to patents, collect statistics generally and specifically for the use of the members, keep on file the records of the Patent Office, bulletins and periodicals relating to patents, and maintain a live list of patent attorneys whom the association can recommend to its members.

To present the solid front of a strong international organization whenever necessary to assert the rights of members collectively or individually.

To acquaint the members with what is going on throughout the world in the great fields of industry, all of which are dependent upon the brain of the inventor.

To advise an inventor who may be in need of advice as to the procedure which would be most advantageous to him and to employ the best legal talent in the land whenever it may be necessary to defend the interests of the association.

To keep always in mind the mutual advantages of organization and break down the barriers which have too long kept inventors apart and at the mercy of those corporations and others who, for but a small consideration, would take from an inventor that which is often of great value, and that simply because the inventor lacked the protection which organization would give, always remembering that in this association there shall ever be the fullest freedom for individual action on the part of a member with regard to his own invention and patent business, entirely independent of his connection with this association, and that the secrecy surrounding his invention shall in no way be affected.

The necessity for such an organization as the International Congress of Inventors is apparent when it is considered that there are between 200,000 and 250,000 inventors in the United States alone. Yet these have been powerless to assert their rights for lack of organized effort when it became necessary to appeal to authorities for redress.

The inventor as a single unit is quite powerless before the Congress of the United States or any of the Congressional committees in matters relating to the rights of an inventor or of inventors as a class. But a powerful, organized body of inventors commands respect and consideration, as is proved by what the Congress of Inventors has already been instrumental in

achieving, for instance, in the matter of an increase in the force of examiners in the United States Patent Office, increase in the salaries of examiners, preservation of the models in the Patent Office and the giving of an impetus for the erection of a new and suitable Patent Office building.

The International Congress of Inventors has accomplished much for which it was established. It has a secretary, assistant secretary and clerical force, a valuable library and complete Patent Office and Congressional files, a tabulated record of a large number of inventors, patent solicitors and lists of great industrial corporations, firms, chambers of commerce, boards of trade, &c. Its membership, already large, is increasing continually. Its officers are: President, George F. Gallagher, Rochester, N. Y.; vice-presidents, A. B. Lamberton, Rochester, N. Y.; H. La Casse, Los Angeles, Cal.; secretary, Ralph T. Olcott, Rochester, N. Y.; treasurer, George B. Selden, Rochester, N. Y. Directors: George F. Gallagher, A. B. Lamberton, H. La Casse, Ralph T. Olcott, George B. Selden, R. H. Salmons, V. G. Lauerma, Henry A. Kunze and Walter S. Strowger, all of Rochester.

The Pig Iron Output of 1907 Exceeded in 1909.

In connection with the pig iron figures for 1909 as reproduced on the following page from the *Bulletin* of the American Iron and Steel Association for February 1, comparisons made with the production in previous years will be found of interest. The total of 25,795,471 gross tons produced last year is the greatest in the history of the industry, being more than 14,000 tons in excess of the previous record made in 1907. The increase over the total for 1908 is 9,859,453 tons, or over 61.8 per cent. The following table gives the production in the last four years in gross tons:

	1906.	1907.	1908.	1909.
First half.....	12,582,250	13,478,044	6,918,004	11,022,346
Second half.....	12,724,941	12,303,317	9,018,014	14,773,125
Totals.....	25,307,191	25,781,361	15,936,018	25,795,471

The production of pig iron in the second half of 1909 exceeded that of the first half by 3,750,779 tons, or 34 per cent.

The production of Bessemer and low phosphorus pig iron in 1909 was 10,557,370 tons, against 7,216,976 tons in 1908, an increase of 3,340,394 tons, or over 46 per cent. In the second half of 1909 the production was 6,084,888 tons, as compared with 4,472,482 tons in the first half, an increase of 1,612,406 tons. The production of low phosphorus pig iron alone in 1909 amounted to 212,615 tons, against 130,616 tons in 1908. The production of Bessemer and low phosphorus pig iron in 1909 was 2,674,250 tons less than in 1907, when it amounted to 13,231,620 tons.

The production of basic pig iron in 1909, not including charcoal of basic quality, was 8,250,225 tons, against 4,010,144 tons in 1908, an increase of 4,240,081 tons, or over 105 per cent. In the second half of 1909 the production amounted to 4,952,644 tons, against 3,297,581 tons in the first half, an increase of 1,655,063 tons. The total production in 1909 was much the largest on record, exceeding by 2,875,006 tons that of 1907.

The production of spiegeleisen and ferromanganese in 1909 was 225,040 tons, against 152,018 tons in 1908, an increase of 73,022 tons. The production of ferromanganese alone in 1909 was 82,209 tons, against 40,642 tons in 1908. Of spiegeleisen alone it was 142,831 tons, against 111,376 tons in 1908. In addition to the above several hundred tons of ferrophosphorus were produced in 1908 and 1909.

The production of bituminous coal and coke pig iron in 1909 amounted to 24,721,037 tons, as compared with 15,331,863 tons in 1908, an increase of 9,389,174 tons. In the first half of 1909 the production was 10,582,455 tons and in the second half it was 14,138,582 tons. A

TOTAL PRODUCTION OF PIG IRON IN THE UNITED STATES IN 1908 AND 1909.

Statistics collected from the Manufacturers by The American Iron and Steel Association, all in Gross Tons of 2,240 pounds.

Production in 1909, 25,795,471 Gross Tons; in 1908, 15,936,018 Tons; in 1907, 25,781,361 Tons; and in 1906, 25,307,191 Tons.

Total Production of All Kinds of Pig Iron.

TOTAL PRODUCTION OF PIG IRON BY STATES.

States	Blast Furnaces.				Production—Gross tons.		
	In blast June 30, 1909.	Dec. 31, 1909.			(Includes spiegel-eisen, ferro-manganese, ferro-silicon, ferro-phosphorus, etc.)		
		In.	Out.	Total.	First half of 1909.	Second half of 1909.	Total for 1909.
Massachusetts	1	2	0	2	9,685	8,703	18,388
Connecticut	3	2	1	3			
New York	15	17	11	28	688,828	1,044,847	1,733,675
New Jersey	3	5	6	11	118,219	176,255	294,474
Pennsylvania	103	134	28	162	4,755,079	6,163,745	10,918,824
Maryland	3	4	1	5	115,260	171,596	286,856
Virginia	9	13	13	26	183,019	208,115	391,134
Georgia	1	0	4	4			
Texas	0	0	4	4	10,101	15,971	26,072
Alabama	19	20	22	51	800,708	962,909	1,763,617
West Virginia	3	3	1	4	63,200	165,082	228,282
Kentucky	3	2	6	8	49,580	36,791	86,371
Tennessee	9	13	8	21	152,628	181,217	333,845
Ohio	44	61	13	74	2,242,987	3,308,558	5,551,545
Illinois	19	23	3	26	1,057,874	1,409,282	2,467,156
Indiana	5	7	0	7			
Michigan	7	11	4	15	420,191	544,098	964,289
Wisconsin	5	6	1	7			
Minnesota	1	1	0	1	171,277	176,900	348,177
Missouri	2	2	0	2			
Colorado	3	3	3	6			
Oregon	0	0	1	1	183,710	199,056	382,766
Washington	0	0	1	1			
California	0	0	0	0			
Total	258	338	131	469	11,022,346	14,773,125	25,795,471

PRODUCTION OF BITUMINOUS COAL AND COKE PIG IRON.

New York	15	17	4	21	688,178	1,043,256	1,731,434
New Jersey	2	5	2	7	93,091	163,755	256,846
Pennsylvania	88	106	12	118	4,510,843	5,744,487	10,255,330
Maryland	2	3	1	4	114,860	169,496	284,356
Virginia	9	12	10	22			
Georgia	0	0	2	2	187,862	216,863	404,725
Texas	0	0	3	3			
Alabama	17	27	19	46	784,712	945,264	1,729,976
West Virginia	3	3	1	4	63,200	165,082	228,282
Kentucky	2	1	6	7	48,928	35,088	84,016
Tennessee	8	12	6	18	161,595	179,314	330,909
Ohio	44	61	8	69	2,242,987	3,308,558	5,551,545
Illinois	19	23	3	26	1,057,874	1,409,282	2,467,156
Indiana	5	7	0	7			
Michigan	1	2	1	3	*440,358	*531,479	*971,837
Wisconsin	4	5	1	6			
Minnesota	1	1	0	1			
Missouri	1	1	0	1			
Colorado	3	3	3	6	197,967	226,658	424,625
Washington	0	0	1	1			
Total	224	280	83	372	*10,582,455	*14,138,582	*24,721,037

* Includes a small quantity of iron made experimentally with manufactured gas.

ANTHRACITE AND MIXED ANTHRACITE AND COKE PIG IRON.

New York	0	0	5	5			
New Jersey	1	0	4	4	268,502	429,929	698,431
Pennsylvania	13	25	14	39			
Total	14	25	23	48	268,502	429,929	698,431

PRODUCTION OF CHARCOAL PIG IRON BY STATES.

Massachusetts	1	2	0	2			
Connecticut	3	2	1	3	10,335	10,294	20,629
New York	0	0	2	2			
Pennsylvania	2	3	2	5	862	1,829	2,691
Maryland	1	1	0	1	1,567	4,031	5,588
Virginia	0	1	3	4			
Alabama	2	2	3	5	15,990	17,645	33,641
Georgia	1	0	2	2			
Texas	0	0	1	1			
Kentucky	1	1	0	1	5,786	8,898	14,684
Tennessee	1	1	2	3			
Ohio	0	0	5	5			
Michigan	6	9	3	12	103,733	128,000	231,733
Wisconsin	1	1	0	1			
Missouri	1	1	0	1	*33,120	*33,917	*67,037
Oregon	0	0	1	1			
California	0	0	0	0			
Total	20	24	25	49	*171,399	*204,614	*376,003

* Includes a small quantity of pig iron made with charcoal and electricity.

TOTAL PRODUCTION OF PIG IRON—ACCORDING TO FUEL USED.

Bituminous	224	280	83	372	10,582,455	14,138,582	24,721,037
Anth. & anth. & coke	14	25	23	48	268,502	429,929	698,431
Charcoal	20	24	25	49	171,399	204,614	376,003
Total	258	338	131	469	11,022,346	14,773,125	25,795,471

Miscellaneous Pig Iron Statistics.

PRODUCTION OF PIG IRON IN PENNSYLVANIA AND OHIO.

Districts	Blast Furnaces.				Production—Gross tons.		
	In blast June 30, 1909.	Dec. 31, 1909.			(Includes spiegel-eisen, ferro-manganese, ferro-silicon, ferro-phosphorus, etc.)		
		In.	Out.	Total.	First half of 1909.	Second half of 1909.	Total for 1909.
Lehigh Valley	13	17	9	26	310,058	380,430	690,488
Schuylkill	8	12	4	16	363,562	358,967	722,529
L. Susq. "	8	14	5	19	251,939	358,032	609,971
Junata "	2	5	4	9	69,387	61,628	131,015
Allegheny Co.	41	46	1	47	2,370,043	3,127,339	5,497,372
Shenando Valley	13	20	1	21	632,825	994,803	1,627,628
Miscel. bitum.	16	17	2	19	756,403	890,727	1,637,130
Charcoal	2	3	2	5	862	1,829	2,691
Mahoning Val.	17	20	2	22	977,596	1,301,054	2,278,650
Hocking "	0	0	1	1			
Lake Counties	10	14	1	15	605,357	959,846	1,565,203
Miscel. bitum.	9	15	1	16	420,223	833,937	1,254,160
H. R. bitum.	8	12	3	15	239,811	213,721	453,532
H. R. charcoal	0	0	5	5	0	0	0

PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON.

New York	285,882	342,544	628,426
Pennsylvania	1,640,469	2,211,137	3,851,606
Maryland	114,860	169,496	284,356
West Virginia, Kentucky, and Tennessee	102,677	191,160	293,837
Ohio	1,507,204	2,120,842	3,628,046
Illinois	799,748	1,004,654	1,804,402
Michigan, Wisconsin, Colorado, and Cal.	21,642	45,055	66,697
Total	4,472,482	6,084,886	10,557,370

PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON IN PENNSYLVANIA AND OHIO BY DISTRICTS.

Lehigh Valley	70,839	71,708	142,547
Schuylkill Valley			
Lower Susquehanna Valley	59,924	59,950	119,874
Allegheny County	873,410	1,269,599	2,143,009
Shenango Valley			
Miscellaneous bituminous	636,296	809,880	1,446,176
Mahoning Valley	806,996	875,843	1,682,839
Lake Counties	410,194	641,135	1,051,329
Hanging Rock bituminous			
Miscellaneous bituminous	290,014	603,864	893,878

PRODUCTION OF BASIC PIG IRON, NOT INCLUDING CHARCOAL IRON.

New York and New Jersey	76,411	390,508	466,919
Pennsylvania—Allegheny County	1,422,169	1,765,518	3,187,687
Other counties	817,880	1,250,678	2,068,558
Virginia and Alabama	181,603	221,300	402,903
Ohio	238,789	607,167	845,956
Indiana, Illinois, Missouri, and Colorado	560,729	717,473	1,278,202
Total	3,297,581	4,952,644	8,250,225

PRODUCTION OF SPIEGELEISEN AND FERRO-MANGANESE.

Pennsylvania	69,197	97,904	167,101
Illinois	22,378	35,661	57,939
Total	91,575	133,565	225,040

PRODUCTION OF ALL KINDS OF PIG IRON FROM 1905 TO 1909.

States—Gross tons.	Production—(Includes spiegel-eisen, ferro-manganese, etc.)				
	1905.	1906.	1907.	1908.	1909.
Massachusetts					
Connecticut	15,987	20,239	19,119	13,794	18,388
New York	1,198,068	1,552,659	1,659,752	1,019,495	1,733,675
New Jersey	311,039	379,360	373,360	225,372	294,474
Pennsylvania	10,579,127	11,247,869	11,348,549	6,987,191	10,918,824
Maryland	332,096	386,709	411,833	183,502	286,856
Virginia	510,210	483,525	478,771	320,454	391,134
Georgia					
Texas	38,699	92,899	55,825	34,345	26,072
Alabama	1,604,062	1,674,845	1,686,674	1,397,014	1,763,617
West Virginia	298,179	304,534	291,066	65,551	228,282
Kentucky	63,735	96,127	127,946	45,086	86,371
Tennessee	372,692	426,874	393,106	200,826	333,845
Ohio	4,586,110	5,327,133	5,250,687	2,861,335	5,551,545
Illinois	2,034,483	2,156,806	2,457,708	1,691,944	2,467,156
Indiana					
Michigan	288,704	369,456	436,807	348,066	964,289
Wisconsin					
Minnesota	351,415	373,323	322,083	148,938	348,177
Missouri					
Colorado	407,774	413,040	468,486	13,971	382,766
Washington					
California					
Total	22,992,390	25,307,191	25,781,361	15,936,018	25,795,471

small quantity of iron made experimentally with manufactured gas is included in the figures for 1908 and 1909.

The production of mixed anthracite and coke pig iron in 1909 amounted to 698,431 tons, as compared with 355,009 tons in 1908, an increase of 343,422 tons. The production of pig iron with anthracite coal alone in 1909, included above, amounted to 16,048 tons, against 1694 tons in 1908.

The production of charcoal pig iron in 1909 was 376,003 tons, against 249,146 tons in 1908, an increase of 126,857 tons. A small quantity of pig iron made with charcoal and electricity is included in the figures for 1908 and 1909. In the first half of 1909 the production amounted to 171,389 tons and in the second half to 204,614 tons. No pig iron was made in 1908 or 1909 with mixed charcoal and coke.

The Warwick Iron & Steel Company.

The Warwick Iron & Steel Company, Pottstown, Pa., has issued its report for the year ending December 31, 1909. The balance sheet as of December 31, is as follows:

Assets.	
Real estate plant and equipment account.....	\$2,116,313.05
Pig iron, raw material and supplies.....	541,811.52
Cash.....	113,206.39
Bills receivable and accounts receivable.....	636,321.27
Total.....	\$3,407,657.23
Liabilities.	
Capital stock.....	\$1,486,715.00
Mortgage bonds.....	195,000.00
Profit and loss account:	
Balance December 31, 1908.....	\$951,985.28
Doubtful accounts collected.....	356.28
	\$952,341.56
Dividend No. 15.....	\$44,449.20
Dividend No. 16.....	44,449.20
	88,898.40
	\$863,443.16
Pig iron account:	
Earnings for the year.....	\$234,848.76
Less interest on bonds and borrowed money.....	10,892.03
	\$214,956.73
Relining account:	
Amount reserved for general repairs.....	\$121,139.52
Bills payable and accounts payable.....	526,402.82
Total.....	\$3,407,657.23

The accompanying statement, signed by Edgar S. Cook, president; Philip Doerr, vice-president, and William S. Pilling, William H. Shelmerdine, F. W. Tunnel, F. H. Bachman and G. E. Schlegelmilch, directors, is as follows:

The unfavorable business conditions prevailing at the close of 1908 continued into the year 1909. Evidences of increased consumption of pig iron did not show themselves until May. For the first quarter of the year there was more or less doubt whether it would be possible to continue operating both No. 1 and No. 2 furnaces. The improvement commencing with May in the way of larger sales, although at the lowest prices of the year, developed into a largely increased demand, with advancing prices, so that it was found desirable to put No. 3 furnace into operation the middle of September. Nos. 1 and 2 furnaces were in blast throughout the entire year.

Our total production of pig iron for 1909 was 281,137 tons, the largest yearly product in the history of the company. Of this total 16,628 tons were contributed by No. 3 furnace. The product of Nos. 1 and 2 furnaces was 264,509 tons. The shipments of the year amounted to 281,064 tons.

The hot blast stoves of No. 1 furnace were rebuilt and enlarged. A large Allis blowing engine has been added to the equipment. Air and steam piping are in course of erection, so that the new engine can be used in connection with either No. 1 or No. 2 furnace. A new electrical unit of 150 kw. was installed during the year, also a water softening plant. It is hoped that the latter will result in much lessened wear and tear, so far as the boilers are concerned.

In order to furnish furnaces with a supply of calcite limestone, uniform as to quality and of shipment, the directors secured a controlling interest in a quarry located in the Lebanon Valley. The quarry is being operated under a satisfactory contract. The quality of the limestone is well suited to the requirements of our manufacture. The acquisition removes one of the elements of uncertainty, so far as the control of an important raw material is concerned.

Outstanding bonds have been reduced to \$195,000. The usual drawing was made June 1, 1909, and \$15,000 of bonds paid and canceled. Dividends of 3 per cent. each were paid, respectively, May 15 and November 15, aggregating \$88,898.40.

Following upon the increased demand for labor, it was found necessary to provide houses for the proper accommodation of our employees. During the year 23 houses were built on the Yarnall farm. The location is a desirable one, sufficiently removed from the works, but yet easily accessible. The homes, while not ex-

pensive, are comfortable and well adapted to the wants of the tenants. The advantages offered by them will add to the efficiency of our employees. The net earnings, as per balance sheet attached, are \$214,956.73.

Briquetting Metal Chips for Use in the Foundry.

In *Stahl und Eisen* of December 1, 1909, Oscar Leyde comments on recent developments in the utilization of cast iron and brass chips or borings. Machine shops when connected with foundries are constantly confronted with the difficulty of caring for their waste chips. A foundry in which no machining of the castings is done is not bothered that way. Many have been the schemes to get over this source of loss, but never with any degree of success until recently. A review of procedure heretofore, particularly in the United States, is very interesting and instructive, the notable experiments of Whitney and Outerbridge with wooden boxes packed with the borings being the first of any account. Even here, with a pretty high melting loss, the reduction of the silicon of the material was so great that a white fracture was the result when using gray iron borings. Kirk recalls that 20 firms using the Whitney system eventually had to give it up.

Recent investigations have shown that when these borings are compressed to a high degree, so that they practically resemble a piece of pig iron, they can be melted just as the latter is, and the results are most satisfactory. The briquettes arrive in the melting zone intact, and do not fly apart, melting a little easier, if anything, than pig iron or scrap. The firm of A. Borsig of Berlin-Tegel, Germany, made the first success in this direction, and others have since taken it up, the process being a patented one. In using briquettes of this kind with the regular charges, even to the extent of 80 per cent. a melting loss of but 3.5 per cent. was observed. Where the briquettes were used alone this rose to 8 to 10 per cent. Compared with the use of the borings loose, where the loss is nearer 50 per cent., the value of the process can readily be seen.

Remelting these briquettes alone has shown the following change in composition: Silicon, from 2.51 down to 1.27 per cent.; sulphur, from 0.105 up to 0.19 per cent.; total carbon, 3.60 down to 2.88 per cent., showing the effect of the melting. This reduction of the total carbon and silicon naturally leads to greater strength in the castings made from mixtures containing the briquettes in question, and a series of tests is given to show this, particularly for cylinder work.

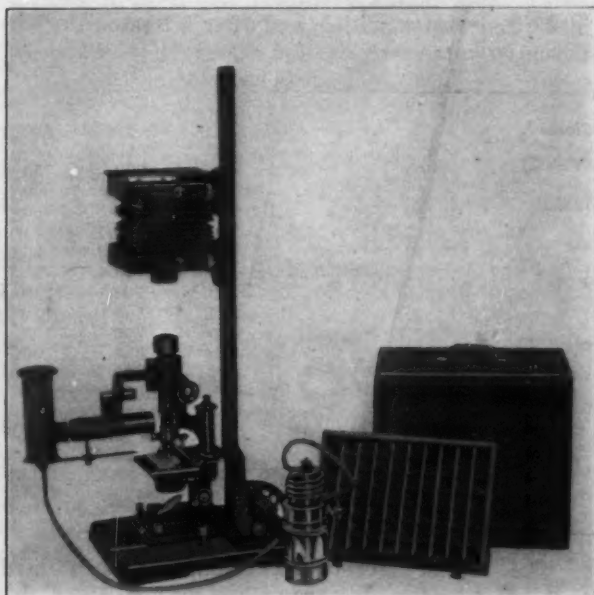
One thing that favors the use of briquettes is their handy size. They can remain out in the open over winter without damage, are very homogeneous, and can be mixed with steel turnings, the ferroalloys, &c., thus affording means of making any desired change in the mixture. In briquetting of aluminum chips, brass and bronzes, this method has brought about a new epoch, as the loss in melting has been brought down to a minimum. The method further has all the advantages of other forms of briquetting without the use of a binder. The peculiarity of behavior in the furnace, so far as a pretty high sulphur absorption is concerned, is that evidently in spite of the heavy compression the flames can penetrate, and with the large surface proportion more sulphur is taken up. As to the carbon, observations seem to indicate that in the upper part of the melting region considerable graphite is burned away as the material begins to melt, and some is taken up again from the fuel when in the hottest part of the melting zone.

Numerous tests of these briquettes in which the heat was interrupted have never found them broken or disintegrated in any way. They melt just as a piece of iron does, only that their greater tendency to oxidation effects makes it advisable to use them in ordinary quantities, and not exclusively, for soft and low sulphur work.

Apparatus for Metallographic Work.

BY S. S. KNIGHT.

Thirty years ago the advent of applied science in the iron and steel business caused somewhat of a commotion among those who had been used to the old methods, based upon experience which had been obtained in the carrying on of actual operations of manufacture without any well understood relations to the fundamental facts upon which they depended. The chemical laboratory and its close ally, the physical testing apparatus, had only thoroughly established their value in the industry when European investigators began to use the microscope upon iron and steel sections, and in a vague way to outline the possibilities of the application of the science of metallography to iron and steel. As is usual with all investigations of this kind, the lack of efficient apparatus greatly hampered the work, and it has been the writer's experience during the 15 years he has been studying metallography to have purchased and discarded no less than four complete outfits, owing to the rapid advance which instrument builders have made. To-day, for



Microscope and Attachments for Metallographic Work.

the first time, he has an equipment which is anything like satisfactory. It is shown in the accompanying illustration. The microscope stand itself is equipped with full substage illuminating apparatus, so that the stage micrometer can be used with the highest power lenses and the actual magnification of specimens at all times readily ascertained. When specimens are being looked at the pack camera is swung back upon the arm entirely out of the way; and yet if a photo-micrograph is to be taken it is merely a matter of swinging the camera up over the microscope, leaving the eyepiece in and taking the picture immediately. The most difficult part of metallographic work is securing the proper illumination, and this has been largely overcome by the apparatus shown.

The condenser itself is the invention of Wirt Tassen, formerly of the Smithsonian Institute, but now of Chester, Pa. The clamping of this condenser to the tube of the microscope itself obviates all difficulty such as is had with other forms of apparatus, owing to the fact that the illumination always follows the lens, regardless of whether a low power, such as 1 in., or a high power, such as $\frac{1}{8}$ in., is being used. The petrographic nosepiece permits of the most rapid changing of the objectives, while the mechanical stage offers an easy and rapid means of thoroughly investigating the

entire field shown on the specimen. The specimen holder, which the writer understands is the invention of Professor Sauveur of Boston, is also a great time saver, inasmuch as the specimens do not have to be mounted in any way, and several faces can be looked at upon each specimen.

The source of illumination, or acetylene burner, being carried right on the condenser and being fully enclosed with an opaque sheet iron chimney, makes the room in which the photo-micrographs are being taken so dark, if the outside light is cut off, that any image upon the ground glass is readily seen. The small acetylene generator is very easily operated and controlled, and where compressed acetylene can be obtained of course this can be done away with and a tank used. The writer has found in his work that a cover glass illuminator is preferable to one of the prism type. The entire outfit, as shown, with five achromatic objective and three Huyghenian eyepieces, can be purchased upon the open market in almost any large city for something under \$175. By using the most sensitive dry plates, magnifications of upward of 1000 diameters can be readily photographed with an exposure of less than five minutes; while such magnifications as range between 75 and 250 diameters require from 15 to 25 seconds.

It is surprising to know the number of individual investigators operating to-day in America in the science of metallography as applied to the iron and steel industry. Hardly any large plant producing steel has connected with it less than one man interested in this line of work. Its immense value is beginning to be well demonstrated, and it is beyond question that the science of metallography almost completely fills the void left by the chemical laboratory, inasmuch as through the latter the composition of the material may be obtained, while through the former its heat treatment is clearly shown. Since these are the two controlling influences upon which the quality of iron and steel are dependent, the work of one almost completely supplements that of the other.

The Williams Vulcan Auto Tool.

The auto tool put on the market by J. H. Williams & Co., 150 Hamilton avenue, Brooklyn, N. Y., and shown herewith, is drop forged from carefully selected steel, milled and ground to correct sizes of openings, tempered, polished and blued. Combining the functions of a dozen tools, its usefulness is extensive in the home and shop or around a motor boat, automobile, &c. The numbers in the illustration designate the different parts as follows: 1, hammer; 2, tire lug wrench; 3, cotter pin puller; 4, gas torch wrench; 5, wire insulation scraper; 6, air tank wrench; 7, spark plug wrench; 8, alligator wrench; 9, cotter pin spreader; 9, 10 and 11, three screwdrivers, and No. 12, a bottle opener. Each auto tool is packed in a canvas bag with button flap, suitable for being carried in the hip pocket. The tool is 8 in. long and weighs $\frac{1}{2}$ lb.



The Vulcan Auto Tool.

The annual meeting of the mechanical section of the Engineers' Society of Western Pennsylvania was held in the Fulton Building, Pittsburgh, on the evening of February 1. An address was made by Richard Hirsch, retiring chairman of the society, on the subject of "The Engineers' Society—Its Future."

Steel for Gears.

Elaborate Tests to Determine the Ideal Combination of Chemical and Physical Properties.

General reference was made in these columns some time ago to the publication by the Council of the Iron and Steel Institute of the first volume of what are called the "Carnegie Scholarship Memoirs." It consists of the reports of the six Carnegie scholars for the year ending in the spring of 1909. One of them, entitled a "Contribution to the Study of Steel for Gears," is a long report by L. P. M. Revillon of Paris. It is of prime importance to those interested in the manufacture of machine parts of great strength, particularly speed change gears, pinions and the differential crown wheels of automobiles. The essential parts are given in abstract below:

In the selection of steels for gears certain qualifications have been considered necessary. In the ordinary condition it should be readily forged and machined, be thoroughly homogeneous and be capable of being punched out in rough shapes approximating closely the finished dimensions. After heat treatment the metal should be of the greatest possible hardness, combined with but very slight brittleness. Surface hardness is more desirable than tensile strength, and

packed in drillings and fine turnings of gray pig iron in cast iron boxes. They showed no trace of oxidation or carburization. The shock tests were made by a Guillery machine, the test pieces being 0.397 in. square, and the notch 2 mm. wide and 2 mm. deep, with the bottom rounded to a radius of 1 mm. The hardness was determined with a Brinell ball machine, using a constant pressure of about 3000 kg., the ball having a diameter of 10 mm.

The steels worked upon may be divided into four classes for purposes of easy comparison.

Steels Without Nickel and Chromium.

Class I is said by the author to comprise steels without nickel and chromium, although two are given by him containing these elements. Their analyses are shown in Table I:

Table I.—Analyses.

No.	C.	Mn.	Si.	S.	Phos.	Ni.	Cr.	Va.
1.....	0.401	0.57	1.89	0.030	0.014	...	...	...
2.....	0.571	0.61	1.24	0.030	0.014	...	...	...
3.....	0.501	0.64	1.64	0.030	0.014	...	...	...
4.....	0.702	0.78	1.87	0.030	0.014	...	...	...
5.....	0.394	0.52	1.98	0.027	Trace	Trace	...	...
6.....	0.452	0.42	0.43	Trace	0.04	1.19	...	...
7.....	0.862	0.23	0.11	0.030	0.014	0.88	0.86	0.06

In Table II. are given the results on these steels in the annealed condition, and after a treatment giving the most suitable results for gears:

Table II.—Class I.

Steel.	1.	2.	3.	4.	5.	6.	7.
Annealing temperature, degrees C.....	900	900	900	900	800	900	750
Elastic limit.....	68,410	74,100	82,490	80,790	78,510	48,780	72,960
Ultimate stress.....	105,820	127,860	123,450	142,510	109,230	87,760	137,960
Elongation, per cent.....	19	15	12.5	15.5	20	19.5	11
Reduction area, per cent.....	39.8	29.3	20.5	35	43.4	51.2	23.8
Shock test, foot-pounds.....	36.1	21.7	32.5	29.3	43.4	43.4	21.7
Hardness No.....	207	225	215	241	203	197	210
Change points—Heating.....	...	...	...	...	850	765	770
Cooling.....	...	...	...	...	770	700	705
Temperature oil quenching, degrees C.....	825	825	825	825	850	850	750
Reheating, degrees C.....	500	500	500	500	500	200	500
Elastic limit.....	159,300	204,500	136,830	197,700	107,810	271,660	221,880
Ultimate stress.....	178,380	219,460	156,450	210,500	135,120	278,770	230,410
Elongation, per cent.....	4.5	5.5	4	2.5	11	3.1	1.5
Reduction area, per cent.....	12.3	15.3	19.3	16.6	43.4	13.9	4.3
Shock test.....	39.8	25.3	75.9	47	47	39.8	36.1
Hardness No.....	315	467	302	435	274	422	388

non-brittleness is of great importance because of the shocks coming on the teeth in operation.

The Best Steel for Gears.

The author's ideal steel for gears should give the following tests after annealing:

Elastic limit, pounds per square inch.....	68,270
Ultimate stress, pounds per square inch.....	99,560
Elongation, per cent.....	20
Reduction of area, per cent.....	50
Resistance to shock, foot-pounds.....	108.5

After the machining is completed and the steel is heat treated it should give:

Elastic limit, pounds per square inch.....	213,400
Ultimate stress, pounds per square inch.....	241,800
Elongation, per cent.....	7.0 to 8.0
Reduction of area, per cent.....	30
Resistance to shock, foot-pounds.....	50.6

The shock test numbers refer to the results obtained on notched bars by Mesnager's method.

The steels worked upon, 26 in number, were obtained from French and German steel works, 24 of them from the leading French makers of gear steel. They included crucible, open hearth and electric furnace products, and were each supplied in the form of a bar 0.787 in. in diameter, and two special forged blanks for high speed pinion and crown wheels. The steels were carefully analyzed, the method being outlined, and tensile, shock and hardness tests carried out. For the tensile test the piece was 0.54 in. in diameter and 3.94 in. between center punch dots.

All the annealings were carried out with the pieces

The greatest defect of steel of this class is its brittleness. If it contains less than about 0.5 per cent. carbon it will not harden sufficiently by the above treatment, so that it becomes necessary carefully to work out other methods. The tempering or reheating is the operation hard to regulate carefully, and in gears the ends of the teeth become the most softened parts, while they should be the hardest. Steel No. 6 was designed to do away with the reheating, and tests on untempered gears gave very satisfactory results. If a few precautions are taken it does not undergo deformation on quenching and is considerably cheaper than silicon-manganese steel.

Low Carbon Nickel-Chromium Steels.

Class II the author makes to include nickel-chromium steels with low percentages of nickel and low and medium percentages of carbon, quenching in water or oil. Their analyses are given in Table III.

Table III.—Analyses.

No.	C.	Mn.	Si.	S.	Phos.	Ni.	Cr.
1.....	0.217	0.54	0.36	0.044	0.009	2.19	0.35
2.....	0.248	0.25	0.084	0.043	0.027	2.75	0.48
3.....	0.425	0.27	0.20	0.042	0.006	2.86	1.20
4.....	0.172	0.53	0.16	0.053	0.006	3.47	0.18
5.....	0.105	0.43	0.11	0.030	0.014	4.38	0.85

In Table IV are given the results on the steels annealed at the temperatures to give the best machining properties, and those that after treatment gave the best results for gears:

Table IV.—Class II.

Steel.	1.	2.	3.	4.	5.
Annealing temperature, degrees C.....	800	800	700	900	800
Elastic limit.....	56,320	61,160	73,070	50,200	60,160
Tensile strength.....	80,690	87,690	105,400	87,760	90,000
Elongation, per cent.....	26	23	22	21.5	20
Reduction area, per cent.....	64.9	55.7	63.2	53	60.5
Shock test.....	133.8	65	112.1	36.1	115.7
Hardness No.....	153	170	197	168	179
Change points:					
Heating, degrees C.....	800	795	820	790	775
Cooling, degrees C.....	680	690	685	690	615
Temp. and bath:					
Quenching, deg. C. { Water 750 Oil 800 Oil 800 Oil 850 Water 750					
Reheating, deg. C.			300		
Elastic limit.....	180,510	189,170	214,820	173,520	173,520
Ultimate stress.....	204,500	225,010	264,550	197,700	201,970
Elongation, per cent.....	10	7	6.3	5	10
Reduction area, per cent.....	44.3	19.3	42.7	15.4	54
Shock test.....	68.6	47	54.2	61.5	72.3
Hardness No.....	370	418	412	328	295

The results are of considerable interest. Steel No. 1 must be regarded as a superior product, it being

hardness after the proper heat treatment, they are so brittle as to be unsuitable for use.

Steels High in Nickel.

Class IV includes steels with high percentages of nickel, with or without chromium. These steels are open to objections; in the first place, is their high cost due to the large percentage of nickel; and, secondly, their great hardness even when in the best condition for service. They are also difficult to machine after the most careful annealing. Their analyses are given in Table VII.

Table VII.—Analyses.

No.	C.	Mn.	Si.	S.	Phos.	Ni.	Cr.	Va.
1.....	0.101	0.35	0.31	0.035	0.003	5.36	1.75	...
2.....	0.157	0.48	0.081	0.024	0.005	7.57	Trace	Trace
3.....	0.172	0.13	0.084	0.018	Trace	15.52	...	...
4.....	0.265	0.24	1.27	0.030	0.014	4.40	2.33	...
5.....	0.266	0.39	0.11	0.030	0.014	4.90	0.85	0.06
6.....	0.360	0.37	0.23	0.053	0.006	4.20	1.15	...
7.....	0.392	0.68	0.35	0.021	0.018	5.19	0.78	...
8.....	0.477	0.95	0.27	0.035	0.013	4.90	Trace	...

In Table VIII are also given the mechanical results on these most interesting steels.

Table VIII.—Class IV.

Steel.	1.	2.	3.	4.	5.	6.	7.	8.
Annealing temperature, degrees C.....	600	800	500	900	750	600	600	600
Elastic limit.....	142,940	60,730	119,400	75,100	93,870	119,610	91,600	120,890
Ultimate stress.....	163,850	90,300	145,080	123,030	142,510	128,290	147,210	142,230
Elongation, per cent.....	13.5	22	6	5.5	6.5	17	14.5	12
Reduction area, per cent.....	58.4	63.2	43.4	9.8	29	62.4	52.8	55
Shock test.....	137.4	133.8	43.4	68.6	39.8	50.6	47	72.3
Hardness No.....	178	186	260	232	288	225	268	290
Change points—Heating, degrees C.....	760	760	675	760	810	770	780	775
Cooling, degrees C.....	460	580	260	530	530	410	250	380
Bath and temperature—Quenching, deg. C. { Water 800 Water 800 Air 750 Water 850 Water 750 Air 850 Air 800 Oil 750								
Reheating.....					500			
Elastic limit.....	168,970	156,880	171,240	160,010	157,730	225,860	...	289,300
Ultimate stress.....	188,020	174,370	188,450	183,190	187,640	235,390	...	292,140
Elongation, per cent.....	10	11	11	10	7	9	...	5.6
Reduction area, per cent.....	56	61.1	52.6	52.5	45.7	24.5	...	38.9
Shock test.....	72.3	94	68.6	57.8	72.3	54.2	32.5	54.2
Hardness No.....	286	326	364	298	300	402	512	477

very readily machined in the annealed state, and giving splendid tests after very simple treatment. A variation of 50 degrees in the quenching temperature is almost without effect.

High Carbon Nickel-Chromium Steels.

Class III includes nickel-chromium steels, with higher percentages of carbon, and so capable of air hardening. The analyses of these steels are given in Table V.:

Table V.—Analyses.

No.	C.	Mn.	Si.	S.	Phos.	Ni.	Cr.	Va.
1.....	0.253	0.52	0.17	0.053	0.006	3.82	1.28	...
2.....	0.306	0.70	0.17	0.021	0.014	2.75	1.48	...
3.....	0.422	0.22	0.11	0.057	0.013	4.09	0.31	...
4.....	0.450	0.28	0.11	0.030	0.014	2.25	0.58	0.07
5.....	0.518	0.27	0.39	0.030	0.006	2.80	0.43	...
6.....	0.771	0.32	0.11	0.030	0.014	1.13	0.19	0.03

The best of the results obtained after suitable annealing and after heat treatment are given in Table VI:

Table VI.—Class III.

Steel.	1.	2.	3.	4.	5.	6.
Annealing temperature, degrees C.....	700	600	600	750	750	600
Elastic limit.....	64,570	126,440	99,560	71,120	81,780	89,910
Ultimate stress.....	114,850	134,410	115,930	122,320	135,830	119,610
Elongation, per cent.....	17.5	14.5	18	13	14	9.5
Reduction area, per cent.....	50.5	59.2	65.8	45.5	49.8	46.7
Shock test.....	...	54.2	101.2	43.4	54.2	39.8
Hardness No.....	...	250	217	220	251	273
Change points—Heating, degrees C.....	735-790	790	700	770	800	820
Cooling, degrees C.....	505-575	325	420	665	695	705
Temperature and bath—Quenching, degrees C. { Oil 850 Oil 800 Air 800 Water 800 Oil 800 Oil 800						
Reheating, degrees C.....	...	...	...	500	300	500
Elastic limit.....	183,350	280,440	189,870	173,520	202,250	181,930
Ultimate stress.....	208,370	292,280	221,020	190,580	215,530	210,500
Elongation, per cent.....	9.5	9.5	8	6.5	7	6
Reduction area, per cent.....	51	36.3	41	47.8	42	14.1
Shock test.....	47	57.8	54.2	79.5	43.4	32.5
Hardness No.....	343	425	306	301	395	425

The last three steels have too high a percentage of carbon, and though they possess excellent properties of

the surface it becomes as hard as the best of the other steels without further treatment. All that is

Case Hardening.

A few experiments were made by choosing the best steels of Class II., Nos. 1 and 5 of Table IV. After from two to three hours at 800 degrees C. there was found an increase of carbon to a depth of 3 mm. It was found best to cool slowly and to quench the pieces after heating up again. The fracture after bending almost completely over and opening out nearly straight again was remarkably good.

Unusual results were obtained with steel No. 1 of Tables VII. and VIII. If it is slightly carburized on

necessary is to pack in a box with a cementing powder and after heating for about two hours at 800 degrees C. to withdraw while still hot and cool in air.

Conclusions.

From a consideration of the practical results steel No. 2 of Tables V. and VI. is among the best of those experimented with. The important conclusions are: 1. Apart from the steels of the first class, which need a complicated heat treatment, it is always possible to find among nickel steels one corresponding to all the requirements of a specific manufacture, and capable of being used after a simple quenching without subsequent annealing. Annealing is impossible to define scientifically from an industrial point of view, and is extremely difficult to adjust uniformly from one piece to another when the size of the piece is altered. 2. When the percentage of nickel is increased it is possible to obtain with a well adjusted carbon percentage a steel which will yield the best results after a simple treatment. 3. Low carbon nickel steels quenched in water are insufficiently hard, but they are susceptible of being case hardened, and thus giving products of superior quality.

G. B. W.

Legal Decisions of Interest to Manufacturers.

ABSTRACTED BY A. I. H. STREET.

Sales of Machinery—Construction of Agreement.—An agreement to furnish machinery subject to tests after its shipment and installation, to determine whether it complied with the warranties on which it had been sold before it was to be fully paid for, which installation and tests would necessarily require considerable time, provided that "the acceptance of the machinery upon arrival shall constitute a waiver of all damages for delays." Held that, construing the entire contract together, the word "acceptance" in such provision was used in the sense only of "receipt," meaning that the voluntary receipt of the machinery on its shipment, notwithstanding delays, should be a waiver of the same, although still subject to the tests as to its efficiency and final acceptance. (United States Circuit Court of Appeals, Third Circuit, Lancaster Electric Light, Heat & Power Company vs. Platt Iron Works Company, 172 Federal Reporter, 314.)

Breach of Contract Not Excused—Misfortune.—A seller agreeing to deliver an engine of a certain make within a certain time, not an impossibility at the time of the contract, is liable for failure to so deliver, though the failure is caused by the destruction of the plant where the engine was made and subsequent strikes among the manufacturer's employees. (Washington Supreme Court, Isaacson vs. Starrett, 104 Pacific Reporter, 1115.)

Right of Seller to Recover Price on Breach of Contract by Buyer.—Where the buyer of an engine from a manufacturer notified the seller before the engine had been seen, tendered, or delivered that he would not accept it, and for this reason there was no delivery and the title at all times remained in the seller, the seller could not sue for the price. (Kentucky Court of Appeals, Fairbanks, Morse & Co. vs. S. W. Heltsley & Co., 122 Southwestern Reporter, 198.)

Measure of Liability for Breaking Shaft.—The measure of actual damages for injury to a shaft while being transported by falling out of the car and breaking was the difference between the value of the shaft before and after the injury to it. (Kentucky Court of Appeals, Stone vs. Adams Express Company, 122 Southwestern Reporter, 200.)

Rights of Seller on Buyer Breaking Contract.—Where a buyer of coke, prior to the time for delivery, notified the seller that he would not accept delivery, the seller was entitled to recover for damages for breach of contract, without proof that he actually had the goods on hand, or tendered them or had actually sold the goods for less than the contract price. The measure of damages for a buyer's breach of a contract of sale is the difference between the contract price and the market value of the goods at the time and place of delivery. (Arkansas Supreme Court, Kirchman vs. Tuffi Bros. Pig Iron & Coke Company, 122 Southwestern Reporter, 239.)

Right of Seller to Stop Goods in Transit.—The right of a seller of goods to stop them while they are in transit to the buyer exists where the goods have not been paid for and the buyer is insolvent, but the right presupposes the vesting of title. It may be exercised before the expiration of the term of credit or the maturity of the buyer's note, at any time before the goods come to the possession of the buyer. The refusal of the buyer to honor drafts drawn by the seller for the price is not in itself such evidence of the insolvency of

the buyer as to justify stoppage. (St. Louis Court of Appeals, F. H. Smith Company vs. Louisville & Nashville Railroad Company, 122 Southwestern Reporter, 342.)

What Constitutes Delivery of Goods to Buyer.—Delivery of goods to a responsible carrier for transportation consigned to the buyer would be a delivery of the goods to the buyer, but, where it does not appear that goods shipped were not consigned to shipper's order, nor that the buyer received the goods from the carrier, an executed contract is not shown. (Arkansas Supreme Court, American Jobbing Association vs. Wesson, 122 Southwestern Reporter, 664.)

Material Subject to Mechanic's Lien.—No material or machinery furnished for use in a factory is subject to mechanic's or materialman's lien except such as becomes part of the realty. (St. Louis Court of Appeals, Banner Iron Works vs. Aetna Iron Works et al., 122 Southwestern Reporter, 762.)

Liability of Warehousemen.—A warehouseman who contracts to store the goods of another in a brick building, but in violation of his agreement stores them in an adjoining wooden building, sheeted with iron, which is less secure, and the goods are burned in a fire which did not destroy the brick building or its contents, is liable for the loss of the goods. In the absence of an express agreement, the law implies that a warehouseman for compensation will exercise reasonable care to protect and preserve property intrusted to him for safe-keeping, and imposes a liability for a loss resulting from his failure in that respect. (Kansas Supreme Court, Locke et al. vs. Wiley, 105 Pacific Reporter, 11.)

Obligation to Pay for Personal Property Sold Under Reservation of Title.—Where personal property is sold and delivered to the buyer under an agreement that title is to remain in the vendor until payment, the loss or destruction of the property while in possession of the vendee before payment, without his fault, does not relieve him from the obligation to pay the price. (Oklahoma Supreme Court, Harley & Willis vs. Stanley, 105 Pacific Reporter, 188.)

Warranties of Goods Sold.—Sellers of goods, not the manufacturers thereof, do not imply by warrant that the goods are merchantable and free from latent defects. To bind a seller of goods on account of any express warranty made by his salesman of the quality of goods sold, the salesman must be shown to have had authority to make such warranty. (New York Supreme Court, Appellate Term, Whitman vs. Jacobson, 119 New York Supplement, 246.)

Sales of Manufactured Articles—Implied Warranties.—The rule that where a manufacturer contracts to supply an article which he manufactures for a particular purpose designed by the buyer and known to the seller, so that the buyer necessarily trusts to the judgment or skill of the manufacturer, there is an implied warranty that the article shall be reasonably fit for the purpose to which it is to be applied, is limited to cases where an article is ordered for a special purpose, and does not apply to cases where a special thing is ordered, though it is intended for a special purpose. One selling a machine need not, in an action for its price, show that any of the parts of the machine were perfect, it being sufficient that they were of fair ordinary quality as compared with the parts of other machines of that kind. (Illinois Supreme Court, Fuchs & Lang Mfg. Company vs. R. J. Kitredge & Co., 89 Northeastern Reporter, 723.)

Damages—Recoverable for Malicious Attachment.—Exemplary damages will not be allowed for wrongfully and maliciously suing out an attachment unless actual damages be shown. To constitute such malice, it is not necessary to prove more than that plaintiff acted with set purpose to injure defendant. If the agents of plaintiff in attachment in charge of his business attempted to coerce defendant to pay a debt by wrongfully suing out an attachment, their action was malicious. (Iowa Supreme Court, International Harvester Company vs. Iowa Hardware Company, 122 Northwestern Reporter, 951.)

Sales of Goods Constituting Interstate Commerce.—The negotiation of sales of goods which are in another State for the purpose of introducing them into the State where the negotiation is had is interstate commerce, and hence is not subject to State regulation, though the sales are by sample or catalogue. (Colorado Supreme Court, Wilcox vs. People, 104 Pacific Reporter, 408.)

Rights Under Conditional Sales.—Where there is an understanding between seller and buyer that title is not to pass until the goods are paid for, the seller may treat the sale as absolute or conditional. The seller by suing for the price elects to treat the sale as absolute. (California Court of Appeal, First District, Elsom vs. Moore, 105 Pacific Reporter, 271.)

Right of Seller to Rescind Conditional Sale Contract.—A seller of machinery on credit who took notes payable in installments for the purchase price, and retained the legal title as security for his debt, may rescind the conditional sale and recover the property (doing equity as to any payments made), as soon as any part of the purchase price becomes due and remains unpaid. (Georgia Court of Appeals, Scott vs. Glover & Co., 66 Southeastern Reporter 380.)

Trade Publications.

Pressure and Vacuum Gauges.—Schaeffer & Budenberg Mfg. Company, Brooklyn, N. Y. Catalogue. Illustrates and describes a great variety of gauges made by this firm for a number of different purposes. These include indicating and recording pressure and vacuum gauges, ammonia gauges, hydraulic gauges, mercury gauges and draft gauges. A new type of the last is illustrated which will indicate draft or pressure in 0.01 in. of water. This gauge is fitted with a large dial which makes it very easy to read.

Automobile Steels.—Carpenter Steel Company, Reading, Pa. Booklet, 6 x 9 in., 34 pages. Relates to the line of crucible alloy steels manufactured by this company for automobile parts. These include chrome-nickel, chrome, chrome-vanadium, nickel, silico-manganese and carbon steels. A brief description of the characteristics of the different brands is given, together with typical illustrations of parts made from them. Summaries of tests for hardness, fragility, resistance to bending, compression and tension and the drop test are given, with a description of the Guillery apparatus employed for the first two.

Steam Traps, Fans and Dry Kilns.—American Blower Company, Detroit, Mich. Three bulletins and a sectional catalogue. Bulletin No. 267 is devoted to the Detroit steam trap and contains illustrated descriptive matter regarding its application, construction and operation. A number of typical applications of the traps are shown. No. 264 deals with the ABC cone fans and contains tables of speeds, capacities, power consumption and dimensions. No. 263 illustrates the line of steel plate fans made by this company and has a number of tables of data. Sectional catalogue No. 265 is concerned with moist air dry kilns for timber products employing both natural and forced circulation of air. The apartment and progressive types of kilns are made for either kind of circulation. The illustrations include a number of installations and kiln specialties as well as views of the different types of kilns.

Oil Engines.—Remington Engineering Company, 1018 North Sixth street, St. Louis, Mo. Circular. Refers to the line of oil engines built by this company for electric lighting, pumping, railroad water service, general stationary power and marine uses. Details of construction and operation are also included.

Exhaust Head and Pipe Fittings.—Franklin Williams, 39 Cortlandt street, New York City. Two circulars. The first deals with the Neverust copper combination exhaust head, which is made with copper shell partitions and screen plate and a one-piece heavy cast iron base and cone. The advantages claimed for this form of construction are lightness, ease of handling, durability and greater efficiency as compared with the ordinary cast iron head. The Neverust exhaust head was described in *The Iron Age* May 20, 1909. The second circular pertains to the line of Tuxeda bronze fittings of this manufacturer and has a table giving the prices of all the different sizes and styles of fittings made.

Factory and Mill Lighting.—Holophane Company, Newark, Ohio. Pamphlet. Size 6 x 9 in., 32 pages. The object of the booklet is summed up in the first sentence, which is, "Good illumination means efficiency, economy, profit." From this text the authors, E. B. Rowe and Frank B. Rae, Jr., proceed to describe and illustrate the use of tungsten lamps and Holophane-D'Olier reflectors to cast the maximum amount of light where it is needed and not in the operators' eyes. A complete line of steel reflectors is also illustrated.

Vertical Turret Machines.—A. D. Quint, Hartford, Conn. Catalogue No. 10. Pertains to a line of vertical turret drilling, tapping and chucking machines. These machines bear the same relation to an ordinary drill press as a turret lathe does to a regular engine lathe. It is claimed that one of these machines will finish all the holes in large or irregular pieces, or jig work, at one setting without any loss of time to change the tools or adjust the work. Some of the illustrations show the machines in actual use while others depict either the machines themselves or parts thereof. An illustrated description of the No. 2 turret drill appeared in *The Iron Age* November 1, 1908.

Feed Water Filter.—American Steam Gauge & Valve Mfg. Company, 203 Camden street, Boston, Mass. Booklet. Describes and illustrates the American H₂O grease extracting feed water filter for stationary and marine engines. Some of the features of this filter are a very large surface for filtration, about 320 times the area of the feed water pipe, which it is claimed insures double filtration; ease of making repairs or changes; and a device for passing steam through in the reverse direction to that of the feed water and thus blowing out the accumulated oil through a drain cock.

Solar Ephemeris.—Keuffel & Esser Company, Hoboken, N. J. Booklet. Gives the position of the sun at apparent noon at Greenwich, England, for each day of the year 1910. Tables of mean refraction corrections and the sun's parallax are included.

Shapers and Gear Cutters.—Gould & Eberhardt, Newark, N. J. Circular and loose leaf catalogue. The former is con-

cerned with the D. T. Q. shapers made by this firm, and shows the patent double train gear drive, which it is claimed gives an exceptionally wide range of speeds for all classes of work. The latter measures 8½ x 11 in. and consists of a number of loose leaves illustrating and describing a line of vertical automatic gear cutting machines for spur, bevel and face gears and racks. Each leaf has an illustration of a machine with a description beneath it. An illustrated description of the automatic rack cutting machine appeared in *The Iron Age* April 2, 1908.

Fuel Economizers and Air Heaters.—B. F. Sturtevant Company, Hyde Park, Mass. Catalogue No. 150. Illustrates the Sturtevant new high pressure type economizer with metal to metal joints throughout, a feature which it is claimed eliminates all chance of leakage. Another advantage claimed is that the scraper cannot bind or stick in these economizers as was the case with earlier designs. The illustrations are very complete and show the different parts entering into the construction of an economizer as well as installations in plants. Tables of general interest to engineers are given as well as examples of the return on the investment, effected by their use.

Corliss Engines.—Murray Iron Works, Burlington, Iowa. Catalogue No. 65. Size, 8 x 11 in.; pages, 84. Illustrates the numerous patterns of the Murray Corliss engines with plain and box girder frames, tange frames and the rolling mill type of frame. Space is given to the different Murray specialties: a special patented variable speed governor, the Murray automatic engine stop, the Murray air compressor, high duty pumping engines, vertical oval frame Corliss engines, two-stage compound Corliss air compressors, boilers, and feed water heaters. The company is prepared to furnish complete power plant equipment, and blue prints are included which give examples of typical installations. An illustrated description of the Murray cross compound Corliss engine built for the mechanical laboratory of the University of Nebraska was printed in *The Iron Age* December 23, 1909.

Punching and Shearing Machines.—Henry Pels & Co., 90 West street, New York. Catalogue. Size, 10½ x 14½ in.; pages, 62. This catalogue covers the line of punching and shearing machinery with steel plate frames manufactured under the Johns patents. The machines illustrated include billet and scrap shears, power presses, a variety of punching machines, beam shears, single and double ended coping machines, bar and angle cutters, bevel cutters, and bar and splitting shears. The bulk of the machines shown are motor driven, but some hand power machines are illustrated in the last few pages. *The Iron Age* April 23, 1908, and January 21, 1909, contained illustrated descriptions of a one-stroke beam shear and the bar, angle and tee cutter, respectively.

Corrugated Sheet Steel Reinforcement.—Brown Holsting Machinery Company, Cleveland, Ohio. Catalogue. Size, 6 x 9 in.; 40 pages. Describes the Ferroinclave type of sheet steel reinforcement, made with dovetail corrugations, for all classes of concrete steel construction such as roofs, floors, sidewalks, interior partitions, stairs, highway bridges, coal bins, culverts, tanks, &c. There are a number of illustrations showing the method of making the sheets and placing them in position, and views of buildings and other structures where it has been used. An illustrated description of this fireproof building material was printed in *The Iron Age* November 26, 1903.

Marine Gasoline Engines.—The Ferro Machine & Foundry Company, Cleveland, Ohio. Catalogue. Size, 7½ x 10½ in.; pages, 24. This is the company's 1910 catalogue, describing and illustrating the mechanical features of the 1910 Ferro engine. The changes in design from that of the previous year are described, together with the power equipment offered, and users are shown how to secure the best results from the engine. Another section is devoted to a description of the jump spark and make-and-break systems of ignition, with examples of just where each should be used. One, two and three cylinder models are made and all of these are illustrated, together with a table giving the principal dimensions. An illustrated description of these engines appeared in *The Iron Age* July 11, 1907.

Grinding Machines and Materials.—Charles H. Besly & Co., 118 North Clinton street, Chicago, Ill. Booklet. Describes and illustrates Helmet spiral circles, oil, glue and cement, together with the different types of Besly grinders. These include spiral disk grinders, single and double spindle grinders, and horizontal disk grinders. Illustrated descriptions of which appeared in *The Iron Age* April 30, 1908, August 5 and September 2, 1909, respectively. In addition the booklet contains much information of value in regard to grinding room practice, and the illustrations show a number of operations being performed by these machines.

Electric Lights and Fixtures.—Pettingill-Andrews Company, Pearl street and Atlantic avenue, Boston, Mass. Monthly publication, *Julis*. The January number is a lighting issue and the majority of the articles deal with fixtures and lamps for electric lighting. The first of a series of special articles covering the work of the fixture department appears, together with descriptions of the Masada lamps and the Opalux reflectors. An article on "Economical Factory Lighting" is also included.

THE IRON AGE

Established in 1855.

New York, Thursday, February 3, 1910.

Entered at the New York Post Office, as Second Class Mail Matter.

DAVID WILLIAMS COMPANY, - - - - - PUBLISHER
14-16 PARK PLACE, NEW YORK

CHARLES T. ROOT, - - - - - PRESIDENT
CHARLES KIRCHHOFF, - - - - - VICE-PRESIDENT
W. H. TAYLOR, - - - - - TREASURER
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The Pre-eminence of 1909 in Basic Steel Production.

The output of pig iron in the United States in 1909, ascertained to have been 25,795,471 tons, establishes a new record at about 14,000 tons beyond that of 1907. At first sight that might be regarded as the most noteworthy fact in connection with these statistics. Of greater significance, however, are the figures representing the production of basic pig iron last year. At 8,250,225 tons the basic pig iron product of 1909 was more than twice that of 1908, 60 per cent. more than the average of the great years 1906 and 1907, twice the production of 1905 and 230 per cent. in advance of that for 1904. As often as the rapid advance of the open hearth furnace has been enlarged upon, the showing indicated by the pig iron figures of last year brings a new and surprising revelation of the magnitude of this movement. In the table following the course of Bessemer and basic pig iron and Bessemer and basic open hearth steel in the past 10 years is shown for ready comparison:

Production of Bessemer and Basic Pig Iron and of Bessemer and Basic Open Hearth Steel in the United States in 1900-1909.
—Gross Tons.

	Bessemer pig iron.*	Bessemer steel ingots and castings.	Basic pig iron.	Basic O. H. steel ingots and castings.
1900.....	7,943,452	6,684,770	1,072,376	2,545,091
1901.....	9,596,793	8,713,302	1,448,850	3,618,993
1902.....	10,393,168	9,138,363	2,038,590	4,496,533
1903.....	9,989,908	8,592,829	2,040,726	4,734,913
1904.....	9,098,659	7,859,140	2,483,104	5,106,367
1905.....	12,407,116	10,941,375	4,105,179	7,815,728
1906.....	13,840,518	12,275,830	5,018,674	9,658,760
1907.....	13,231,620	11,667,549	5,375,219	10,279,315
1908.....	7,216,976	6,116,755	4,010,144	7,140,425
1909.....	10,557,370	.....	8,250,225	.....

* Includes low phosphorus pig iron after 1900.

It will be seen that the production of Bessemer steel in the decade has averaged about 88 per cent. of that of Bessemer pig iron. The comparison between basic pig iron and basic open hearth steel involves considerable variation. Prior to 1905 the basic open hearth ingot and castings output was more than twice that of basic pig iron. In that year, and in all subsequent years, the ratio has been less than 1 to 2. Scrap, as has been often pointed out, has been used in a declining percentage, while the percentage of pig iron, largely in the form of direct metal, has been increasing.

It is plain to be seen that the production of basic open hearth steel last year was far beyond that of Bessemer steel. The basic lined open hearth furnace took

the lead in 1908, the margin being more than 1,000,000 tons. It is probable that the gap will be shown to be more than 5,000,000 tons when the steel ingot statistics for 1909 are made up. Whereas the record production of Bessemer and open hearth ingots in 1907 was 23,217,285 gross tons, indications are that in 1909 this amount was exceeded by more than 1,000,000 tons. The accelerated consumption, due in part to the rebuilding of run down stocks of finished steel which went on in the latter part of last year, made it by far the pre-eminent steel making year in the history of the industry.

The Expansion of the Western Steel Industry.

A feature of the revival in iron and steel in the past year was the drift to the westward. The greatest increase in activity has been in the Mississippi Valley, where the requirements of many industries for bars and other products exceed all records. The Chicago District is now producing at the rate of about 4,500,000 tons a year of Bessemer and open hearth steel ingots and additional capacity is under construction. It has so long been the habit to think of the supplying of most of the Western demand by Western mills as of the indefinite future that the actual extent of present rolling mill operations there is scarcely recognized.

While Eastern rail mills have light order books, the Chicago mills have taken business which will carry them comfortably through the year 1910 if no further orders were taken. In the bar trade the West has become practically independent of the districts east of Indiana, as the new merchant mills at Gary, in addition to about 1,000,000 tons of bar mill capacity already existing in the West, will be able to take care of the business. In bar iron the Chicago mills are independent of Eastern competition and have been for some time, and a practically new branch of the bar trade has become firmly established with four mills in the West rolling hard steel bars from old rails.

The steel car works projected in the Gary district, in connection with other shops already established or under construction in the West, will be able to meet the requirements of the Western railroads, and new locomotive shops also projected in the Gary district will be able to supply much of the demand from the West for locomotives. The larger city population of the Eastern States may require the greater tonnage of structural material, but the cities of the prairie States are coming forward rapidly in the construction of steel buildings, and the mill and fabricating capacity west of Ohio will contribute in a very important way toward supplying their needs.

For more than 20 years Illinois has been the leading State in the production of agricultural implements, and now does nearly half the entire business of the United States. Illinois also takes high rank in the broad census classification of foundry and machine shop products. The West has taken the lead in the production of malleable iron castings, as well as in the steel casting industry. Not a few of these steel foundries have grown to a rate of production well beyond 100 tons a day, and several announcements have recently appeared of the construction of 20-ton and 30-ton open hearth furnaces in Western steel casting plants.

In wire products the West has been independent for many years. The sheet mill capacity of the Chicago

District will be largely augmented in the coming year while tin plates, for years an important Indiana product, will in time figure in the output at Gary. Great possibilities are suggested by the successful installation last year in the Chicago District of a 15-ton Heroult electric furnace for refining steel. The product of this furnace, amounting to several thousand tons a month, has been sufficient to provide Western roads with 500-ton experimental lots of steel rails, which have shown remarkable ability to resist hard usage. If the cost of this electrical treatment is low enough to permit of it being used for rail steel, it is to be expected that steel refined by this process will find a variety of other outlets in products which command a higher market value.

The West has abundant resources in steam and heating coal which is delivered around the foot of Lake Michigan at a cost for mining and freight not greatly beyond the prevailing cost in the Pittsburgh and Ohio districts. Many efforts have been made to produce coke from Indiana and Illinois coal, but without satisfactory results thus far, although experimental work is still under way. For several years, however, by-product coke made in the Chicago District from Eastern coal has supplied the local demand for foundry coke, and at Joliet the blast furnaces have been operated the past year with by-product coke, the power obtained from the gas being practically sufficient to dispense with the use of steam coal. At Gary the by-product ovens under construction will produce 2,000,000 tons of coke annually, and the gas will be used for power, this supply, in addition to that derived from the blast furnaces, being considered ample for all the subsidiary industries that are in contemplation.

The Distribution of Connellsville Furnace Coke.

It is a well recognized fact that there is a greater preference for Connellsville furnace coke in times of extreme furnace activity than when the demand for pig iron is light. In quiet periods the furnaces are more willing to use the less desirable fuels, from other districts, partly because it is not so important to obtain maximum outputs at such times, and partly because prices are naturally low and it is more important to effect all possible economies.

Of the furnaces which use Connellsville coke at all times the great majority conduct their own coking operations. There are others, however, which invariably buy Connellsville coke. Then there is a broad twilight zone, composed of furnaces which sometimes use Connellsville coke and sometimes other cokes. The dividing line between Connellsville and other cokes is not determined so largely by freight rates as is the case with the other raw materials of the blast furnace, limestone and ore. Often Connellsville coke is shipped past a furnace which uses some other coke, so that the line of demarkation is not drawn geographically. When there is an expansion in the use of Connellsville coke it is not necessarily by outlying districts being captured; the conversion to Connellsville coke may occur with a furnace not at all distant from the center of production.

The greatest interlacing of furnaces using Connellsville coke with furnaces using other fuels is in the East. There are, of course, the anthracite and mixed anthracite and coke furnaces; but there is much

more than that, for a large tonnage of Connellsville coke is consumed in New Jersey, while many central and eastern Pennsylvania furnaces much nearer Connellsville use other cokes. New York State uses a large tonnage of Connellsville coke, but also uses other Pennsylvania cokes. The greatest density of Connellsville coke consumption is in the immediate Pittsburgh District and the Mahoning and Shenango valleys. Even there the Connellsville product is not supreme, for the largest independent steel interest in Pittsburgh has supplied its wants almost exclusively from coke of its own manufacture, made from coal outside the recognized Connellsville basin. For some new furnace capacity it is bringing in, however, this interest supplies Connellsville coke, purchased on a three-year contract. Besides this prominent case there is a considerable tonnage of coke from outside the Connellsville region used in Pittsburgh and the two valleys. Farther west the line is fairly distinct, so that south of it, in southern Ohio, for instance, Connellsville coke is not used at all, while north of the line there is a mixture, coke from the Pocahontas field and local cokes being used quite largely.

In no case do statistics of coke production attempt to segregate furnace coke from other grades, foundry coke and coke for domestic purposes, so that at the best comparisons between coke production and pig iron production are inexact. Of the production of the Connellsville and lower Connellsville region about seven-eighths is furnace coke, there being, roughly, about 10 per cent. of foundry coke and possibly $2\frac{1}{2}$ per cent. of coke for domestic and other purposes. In order to furnish a rough idea of the distribution of Connellsville furnace coke and the variation in its field under different industrial conditions, we have prepared a table, using the statistics of monthly shipments which the Connellsville *Courier* compiles at the end of each year, and our own statistics of the production of pig iron. As representing conditions in the last high pressure period, we have selected the first quarter of 1907. As representing conditions under a hard times basis, we have selected the second quarter of 1908; while as representing present conditions the last quarter of 1909 is naturally taken.

The *Courier* statistics as compiled and revised at the end of the year show shipments to the East, to Pittsburgh and to the West. As representative of the East we have taken Pennsylvania, excluding the Pittsburgh District and the Shenango Valley. It is true that New Jersey uses considerable Connellsville coke, but there is much coke used in the eastern part of the State which is not Connellsville. The State of New York is necessarily excluded, being neither East, Pittsburgh, nor West, although good sized shipments of Connellsville coke are regularly made to Buffalo. The Pittsburgh District in our blast furnace statistics fits well with the *Courier's* designation. For the West, we include the two valleys, exclude southern Ohio, and by reason of the grouping followed in the blast furnace statistics include of necessity Indiana, Illinois, Michigan, Minnesota, Wisconsin, Missouri and Colorado. The table follows:

	The East.		Percentage Coke, coke to Net tons. pig iron.
	Pig iron. Gross tons.	Coke. Gross tons.	
First quarter, 1907.....	882,855	390,389	44.2
Second quarter, 1908.....	419,614	149,858	35.7
Fourth quarter, 1909.....	1,020,272	458,275	44.9

Pittsburgh.			
First quarter, 1907.....	1,490,019	1,592,148	106.2
Second quarter, 1908.....	821,225	806,855	98.3
Fourth quarter, 1909.....	1,786,043	1,852,121	103.7
The West.			
First quarter, 1907.....	2,395,178	3,044,063	127.1
Second quarter, 1908.....	1,299,153	1,376,332	106
Fourth quarter, 1909.....	2,016,735	3,179,248	109

In the East the sharp dip in Connellsville coke shipments proportionate to pig iron production from the period of great activity to the period of greatly reduced activity was followed, on the resumption of activity, by a return to almost exactly the former percentage. Making allowances, pro and con, for the anthracite furnaces, for New Jersey consumption and for coke other than furnace coke, it may perhaps be said, roughly, that in prosperous times between 40 and 45 per cent. of the coke pig iron in the East is made with Connellsville fuel, while in times of poor demand the proportion is reduced by about a tenth.

Coming now to the Pittsburgh District, it is observed that the proportion of coke to pig iron dropped from 106 per cent. to 98 per cent. and then increased to 104 per cent. These, of course, do not represent the true percentage of Connellsville furnace coke to pig iron made from Connellsville coke, for the coke includes foundry and other coke, probably an eighth or a tenth of the total, while the pig iron includes some iron made with other fuel. The dip, however, is trustworthy, being between 6 and 7 per cent. below the average of "before and after." A factor for which some allowance should be made is that in high pressure times blast furnaces cannot be as exacting as to the quality of coke shipped to them, and fuel consumption runs up.

In the West the proportions also run above 100 per cent., due to the inclusion of foundry and other grades of coke, together with some export coke. In this region, however, we see the dip in hard times, but we do not find the full return to the *status quo ante* which is observable in the East and in the Pittsburgh District. Instead, the proportion drops from 127 per cent. to 106 per cent., and then returns only as far as 109 per cent. The failure in the last quarter of 1909 to restore the conditions of the first quarter of 1907 is presumably due chiefly to the increased use of Pocahontas and by-product coke in the Chicago District.

The Corporation Tax.

Various associations of manufacturers are co-operating in an effort to secure relief from the publicity required by paragraph 6 of the new Federal corporation tax law. It is believed that this provision of the statute should by all means be repealed, and a strong effort is to be made to induce Congress to take such action. The publicity requirement is claimed to be discriminatory and unfair, as it gives a business organized as a partnership an advantage over a business organized in corporate form. Some difference of opinion prevails on this phase of the question, as it would, of course, be much more satisfactory to all concerned to have the entire act repealed. In view of the possibility that the act may be declared unconstitutional, numerous manufacturing corporations are being advised to make the reports required and pay the tax, but to do both under protest. Action of this kind will enable claims to be made for the refund of the amounts paid in case the law fails to stand the constitutional test.

Maintaining Machinery Prices.

The machine tool trade, in establishing the principle of adherence to list prices in its relations with consumers, has set an example which is having a large influence upon other branches of industry, especially those which may be classed as kindred lines. They are moving toward a similar custom, the adoption of which would mean a great difference in their profits as well as better co-operation in various directions, all of which would prove mutually beneficial. The subject has various phases, some of which may serve as modifications of the principle, unless they are abolished. One of these is the matter of reduction in prices to the large consumer, a topic which has been given little public discussion, but which is destined to be defined more strictly. Those who advocate no discrimination between the large and small user believe that the nature of the machinery business is bound to bring about the adoption of their idea.

The whole topic was discussed at a recent meeting of builders of woodworking machinery, in the progress of which a letter from one of the leading American machine tool building concerns was read, describing the practice adopted by the company, which is a comprehensive exposition of the subject. The letter was, in part, as follows:

"Our prices are uniform in being quoted f.o.b. the factory, the same to the large and small user, whether one machine or 50 machines be ordered, and in being free from discount for any reason whatsoever. If a customer should wish the omission of certain parts of a machine he is given credit for them on the bill. Our terms are the same to all—30 days from date of invoice—and if a customer wishes to place an order with the expectation of having a reasonably longer time we expect him to agree to pay interest therefor.

"Our feeling is that any party making a machine tool in which he takes any pride at all has a right to set a price at which he will sell to any one who will pay such a price, without being subjected to having such a figure scaled down at the will and threat of the buyer. By so doing the manufacturer can better calculate upon a certain return from a given amount of capital invested, he can do his business with vastly more ease and comfort, and does not have to employ salesmen who have qualifications other than those of knowing the machines and the ability to explain them; and from time to time as improvements are made he is at liberty to change his prices that were formerly quoted as standard, with the probability that the reason for such a change will be appreciated by the customer.

"Last of all, what is more important, when a customer is persuaded that a manufacturer has a stable price, he grows to like it because he can always rely upon the certainty of any quotation.

"Any manufacturer who intends to put a uniform price in practice must undertake it with a good deal of resolution, especially if there has been a long standing habit of quoting an excessively varying price, for purchasing agents are most insistent and will try every possible means of cajoling, in order to have salesmen and others break a rule which has been laid down. Though our present practice has been a rule with us from time immemorial, at rare intervals we are approached even now to give freights, to give discounts for quantities, or a discount for cash, but when our

customers have our practice carefully explained to them we do not find that the explanation causes any trouble.

"Doubtless one feature of our system of uniform price may cause some discussion—that is, whether a reduction in price should not be given to the large user of machinery. Our feeling is that the manufacturer, in setting his price on a machine, should base it upon a cost which includes the whole selling cost besides the whole manufacturing cost, and that the large user, if he is in need of several machines, should pay proportionately for the number of machines which he wishes to buy. While the small customer requires more or less work in order to make a sale, not to speak of attention after the machine is acquired, the large manufacturer, in one way or another, demands a proportionate amount of attention. Our attitude, in this matter of one price to large and small, represents our estimate of the character of the machine tool. It is not a commodity like sand or pig iron, nails or screws, or even akin to hammers, vises or wheelbarrows, but an article which represents the best art of draftsman and mechanic working together, and demands adequate recognition as such from the user."

Commercialism in Engineering Courses.

In a recent address which has attracted much attention, Prof. G. E. Swain, head of the department of civil engineering of Harvard University, made sweeping criticisms of the efficiency of engineering school graduates at the beginning of their professional careers. He held that the courses contain too little of the practical application of scientific theory. "Science teaches us to know and art to do," he said, and argued that not enough attention is given to art. None would dispute his words, when he said: "The engineer must be largely a business man. Engineering is business to a very large degree. The engineer deals not only with the design of works, but with their executive and commercial value. His usefulness will be strictly limited unless he knows how to advise, not only concerning the design, but whether they should be designed at all. He must know how to draw up a contract, how to deal with men, how to smooth difficulties, how to arbitrate when opinions differ, and in many cases how to manage large financial transactions. Engineering is an applied science, and its application is directed in 99 cases out of 100 to just one thing—to making money for somebody. No quality will be found of greater value to the engineer than commercial acumen. The young man who looks upon engineering purely as a science or as the art of applying a science, independent of business principles, will very likely remain a drudge all his life, directed by men of far less scientific ability, but of greater business acumen." But Professor Swain goes perhaps a little too far when he says: "Few of our engineering students really gain the scientific spirit; few of them learn how to reason correctly; most of them are unable to draw correct conclusions from clearly stated premises, and the great majority seem to think that an engineering education is simply learning the rules by which engineering work is done. They inquire simply how, not why; and this attitude is often encouraged by the character of the instruction they receive."

A generation ago most of the engineering schools

devoted their entire course to theory, on the ground that they furnished the student with the tools, the skillful use of which would come normally in the practice of his profession. The institutions which early adopted practical work for their students, in connection with theoretical training, received scant tolerance from the mass of educators. "We turn out engineers, not mechanics," was their comment. This has changed very radically. Commercialism has been introduced into the curriculum, because its various phases are now recognized as branches of science in themselves. The electrical and mechanical engineering courses have profited greatly in this respect, and Professor Swain's own science has developed to a considerable extent along such practical lines. "The art to do" is receiving constantly increasing attention. Employers of labor have had a large influence in bringing about the new order of things. They have led the educators away from their traditions. Co-operation between managements of engineering schools and the men who are to employ the graduates has grown in a large way, even to the point of the semi-special education of individual students during the regular course, in the preparation of theses, with prizes offered by manufacturers as inducements. The business spirit which Professor Swain deems so important must inevitably be an objective in the training of future engineers.

CORRESPONDENCE.

British and German Export Trade in Iron and Steel.

To the Editor: I note with interest your article, "Germany Pressing Great Britain on Iron and Steel Exports," which appears in your issue of January 20. I would be interested to know whether the tonnage named for Great Britain includes ships built for foreign countries. It seems to me natural that as the demand for machinery grows and the population of the world increases other countries besides Great Britain must manufacture iron and steel products; but that it should be taken for granted that Great Britain is falling behind when other countries are making advances is not clear, for the reason that there is a limit to the number of people available for different industries, and therefore a limit to the output of any individual country. Judging from the following table, which has been compiled from information given in the daily newspapers, Great Britain still leads the world. These figures surprise one after reading so much about the decay of British industries:

Foreign Trade of Great Britain, Germany and the United States in Millions of Dollars.

Country.	Area. Square miles.	Imports.	
		1909.	Gain in 14 years.
Great Britain.....	121,483	3,086.2	1,015.3
Germany	208,830	2,000	921.7
United States.....	3,022,933	1,311.9	582.3
		Exports.	
		1909.	Gain in 14 years.
Great Britain.....	2,283	805.2	5,319.2
Germany	1,075	952.9	3,675
United States.....	1,063	872.2	2,974.0
		Total trade.	
		1909.	Gain in 14 years.
Great Britain.....		5,319.2	1,910.5
Germany		3,675	1,874.6
United States.....		2,974.0	1,454.5

It might interest your readers to compare these figures.

HENRY JAPP.

RICHMOND HILL, L. I., January 25, 1910.

[Our correspondent's figures for the United States for 1909 should be 1,475.6 for imports and 1,728.2 for exports. Those for Great Britain and Germany for the same year are also, no doubt, early estimates and subject to revision. The figures given in our article of January 20 did not include vessels or machinery of any description, being confined to the products of iron and steel works, chiefly blast furnaces, steel works and rolling mills.—EDITOR.]

Newfoundland's Royalty on Iron Ore.

TORONTO, January 28, 1910.—In the speech from the throne at the opening of the session of the Newfoundland Legislature January 26, it was announced that the Government would introduce legislation to establish a royalty of 7½ cents a ton on the gross output of the Bell Island iron mines. This measure will not take by surprise the Canadian companies operating these mines, as, according to further information given in the speech, the matter was the subject of discussion between them and the Government, and the imposing of the royalty will be in pursuance of an understanding thus reached. As the gross output has averaged about 1,000,000 tons annually for some years, the return from the tax can be safely counted on as not less than \$75,000 a year. There is every probability that the mines will be worked on a much larger scale in the near future, and that their annual output will progressively increase for a long time to come.

The idea of turning the Bell Island iron mining industry to account for revenue purposes has been broached from time to time. The proposal oftenest brought forward was that of an export duty of 20 cents a ton. Doubtless the Newfoundland Government would have been glad to make the rate as high as that if it had been in a position to turn to the alternative of establishing domestic steel works. But it is not in such a position. The deposits are owned by the steel companies in Cape Breton, and these could not be induced by a 20-cent rate to abandon their works there and establish new ones in Newfoundland. In the latter country they would have an extremely small home market to depend upon, they would have practically no protection from outside competition, and they would be barred from the Canadian market by high duties. A 20-cent export duty on Newfoundland ore would stimulate prospecting for ore deposits in Canada and would tend to drive the companies to Cuba and elsewhere for their ore supplies. Very possibly the royalty will be increased as opportunities warrant and as revenue needs may prompt, for Newfoundland is bound to develop. She has great natural resources, and her difficulties appear to be behind her.

Though the rate is not large, neither is it a negligible quantity in the cost of steel production at the Cape Breton works. Beginning at nearly the same time as the Canadian bounties cease, the royalty will not be unfelt by the companies upon whose material it falls. But it is to be remembered that the ore is of high grade, that the deposits are believed to be much more extensive than they seemed to be at the time the companies acquired them, and that they were bought at a price far below what they could be sold at to-day. If the companies had now to purchase their ore from other holders of these mines, the cost of their material would very greatly exceed what it now is with the royalty added. The companies have still the advantage of very cheap material.

That the companies can well bear the cutting off of the Canadian bounties and the imposing of the Newfoundland royalty would seem to be put beyond doubt by the success of the Dominion Iron & Steel Company in competing for large rail orders in India and Australia. If the company could undersell British, German and other foreign railmakers in such markets, its ability to manufacture at a profit for the home market must be independent of the bounties or the royalty.

C. A. C. J.

The Mechanics and Traders' Exchange, 30 to 34 West Thirty-third street, New York, held its annual election January 27, with the following result: President, Francis N. Howland; vice-president, Frank E. Conover; treasurer, Isaac A. Hopper; secretary, Charles E. Cheney; trustees, Alfonzo E. Pelham, Au-

gustus Meyers, John J. Roberts, Edwin Outwater, Lewis Harding, Francis M. Weeks, Ronald Taylor; representatives on Board of Examiners, Building Department, Lewis Harding, William Crawford; inspectors of election, F. B. Tuttle, C. E. Cheney, Edmond A. Vaughan.

The Republic Iron & Steel Company.

The Republic Iron & Steel Company has issued a statement of its income account for the half year ended December 31, 1909, which compares as follows with the corresponding period of the previous year:

	1909.	1908.
Net earnings from operation*.....	\$1,901,400	\$1,231,648
Other income.....	72,211	27,307
Total net income.....	\$1,973,611	\$1,258,955
Appropriated for improvements, depreciation, &c.....	439,862	267,987
Net profits.....	\$1,533,749	\$990,968
Interest.....	199,357	208,638
Balance for dividends.....	\$1,334,392	\$782,330
Preferred dividends.....	794,796	.....
Surplus.....	\$539,596	\$782,330
Previous surplus.....	5,920,535	4,699,527
Total surplus.....	\$6,460,131	\$5,481,857
Back preferred dividends paid.....	1,378,141	.....
Final surplus.....	\$5,081,990	\$5,481,857

* After deducting charges for maintenance and repairs amounting to \$598,375, as against \$401,856 last year.

Unfilled orders in finished and semifinished products December 31, 1909, amounted to 457,785 tons in comparison with 392,420 tons June 30, 1909, and 391,040 tons December 31, 1908. The company had on hand December 31, 1909, unfilled orders for pig iron amounting to 39,995 tons in comparison with 94,247 tons June 30, 1909, and 89,934 tons December 31, 1908.

The balance sheet as of December 31, 1909, shows an increase in the preferred stock of \$4,583,100, the total now being \$25,000,000, and an increase in cash on hand of \$4,917,147, the total now being \$5,135,792. The contingent liability on account of guarantee of Hazelton Steel Tube Company notes is \$1,500,000.

An accompanying statement by John A. Topping, chairman of the Executive Committee, says:

"The general improvement in business anticipated in the last annual report has been fully up to expectations, and the net earnings for the period of this report show substantial improvement as compared with the six months period for the year ended December 31, 1908, but as compared with a similar six months period of 1907 less profits were made. The reduction in profits as compared with the 1907 period is due entirely to lower prices on sales of manufactured products. As a result of appropriations and expenditures for improvements and labor saving devices, the cost of production has been largely reduced, notwithstanding the fact that labor rates and cost of general supplies are substantially on the basis of 1907. The reduction in cost, however, has been more than offset by the greater reduction in selling prices, so that the profits per ton during the period of this report are necessarily less than for the six months period ended December 31, 1907.

"The tube works referred to in the last annual report have been substantially completed, and it is expected that operations in this department will begin not later than March, 1910. Sales of tubular products will add volume and diversity to the business and will strengthen the earning power of the company. Substantial progress is being made on the construction of the Hazelton Steel Works referred to in the last annual report. It is not probable, however, that any benefit from the operations of this department will be realized during the present fiscal year. The outlook for the future is encouraging, with the prospect of better average prices and an increased volume of business."

Canada's Tin Plate Company Assigns.

TORONTO, January 29, 1910.—The Canadian Sheet Steel Corporation has assigned. Its liabilities are estimated at \$450,000 to \$500,000, and its assets are supposed to be about the same. Few Canadian enterprises have had such an experience of vicissitudes extending over so short a period as the one that has thus passed into the hands of its creditors.

The plant, which is at Morrisburg, Ont., was erected and equipped for the manufacture of tin plate. Tin plate was on the free list, and at the time was purchasable in the British market at low prices. A large and well established trade that had been built up here by Welsh manufacturers had to be captured if the industry was to prosper. Moreover, the competition of United States tin plate exporters was beginning to be felt. But the sanguine promoters pushed their project along and left the impression on the minds of prospective investors in the company that the Government could be depended on to put a duty on tin plate imports.

When the budget and tariff revision scheme of 1907 were brought down tin plate was found to be still on the free list. The Finance Minister gave reasons for not yielding to the petition for a duty. Counter petitions had been presented, in which manufacturers of tinware, producers of fruits, vegetables, fish, &c., the operators of canning factories and the consuming public were joined together in great force to protest against the added cost the duty would entail.

But the works were put in operation. From the first the strain of competition was felt to be disabling. Relief was sought in slackening operations and in closing down from time to time. An appeal was made to the Government to make tin plate imports subject to the antidumping duty. This appeal was not for some time granted, the position being taken that the domestic supply of tin plate was not sufficient for the needs of the trade. The company then had the misfortune to have its works badly damaged by fire. But it did not go out of business. One or two new men of wealth and political influence were brought into the company.

After a time the Government became satisfied with the quality and quantity of the output and placed tin plate on the list of articles subject to the antidumping duty. Still, the company found difficulty in going on, and after a short career under the new auspices it fell into other hands. These energetically applied themselves to the task of making the works pay. Strong efforts were made to induce the Government to put on a duty of at least 15 per cent. These were without success.

The new company, called the Canadian Sheet Steel Corporation, converted the works very largely to the business of making black and galvanized sheets. Its output of tin plate having declined, the Government suspended the antidumping duty. Difficulties were also encountered in the matter of power. The town of Morrisburg gave aid to the undertaking. It entered into arrangements with the Dominion Government to develop hydro-electric power on the canal, which is a Government work. The company was to be supplied therefrom with power for which a certain rate was to be paid to the municipality. There were deadlocks, delays and new arrangements in respect to this matter, and it was not until quite recently that a final understanding was reached.

The company's plant is said to be an excellent one. The town is interested, both as an investor and as a considerable labor center, in having the works kept in operation. It is considered improbable that it will long be idle.

When the antidumping duty was maintained the benefit went mainly to the Welsh exporters of tin plate to this market, as it prevented the sale of United States tin plate here at sacrifice prices. The removal of the

antidumping duty was complained of even more by Welsh exporters than by the Morrisburg manufacturers.

C. A. C. J.

Dedication of Thurston Memorial Tablet.

The New York monthly meeting for February of the American Society of Mechanical Engineers, to be held on the evening of February 8 in the Engineering Societies Building, 29 West Thirty-ninth street, will be devoted to the dedication of a bronze memorial tablet to Dr. Robert H. Thurston, the first president of the society. All associates and former students of Dr. Thurston are earnestly invited to attend these exercises to show their esteem for him as a friend and in recognition of his brilliant career as an engineer and educator. Addresses will be given upon Dr. Thurston as a man and his life work, by speakers of wide reputation who knew him intimately. These addresses will touch upon his experience as an engineer of the navy during the Civil War, his work as an educator at Stevens Institute of Technology and at Cornell University, his achievements as engineer and investigator, as an author and his long relationship with the American Society of Mechanical Engineers.

Among those who will participate are Prof. John E. Sweet, closely associated with Dr. Thurston in the organization of the society; Col. E. A. Stevens, the prominent representative of the Stevens family, founders of Stevens Institute; President J. G. Schurman of Cornell University; Prof. Albert W. Smith, Dr. Thurston's successor as director of Sibley College, and William Kent, consulting engineer. It is expected that Mrs. Thurston will attend. Dr. Alex. C. Humphreys, president of Stevens Institute, will be the chairman.

The memorial which is to be unveiled is the work of Herman H. McNeil, a former student and personal friend of Dr. Thurston. It is a replica of the memorial tablet presented to Sibley College, Cornell University, by alumni and students of the university. The tablet was placed in the rooms of the society through the generosity of members and their devotion to Dr. Thurston. Contributions were received by a committee consisting of John Fritz, S. W. Baldwin, Prof. R. C. Carpenter, W. C. Kerr, E. A. Uehling, Wm. Hewitt and Gus. C. Henning. The installation of the memorial and the arrangement for the dedicatory exercises were made by a committee consisting of Dr. Alex. C. Humphreys, chairman, and Chas. Wallace Hunt, Fred J. Miller, Prof. R. C. Carpenter and J. W. Lieb, Jr.

The Mechanical Engineers' Joint Meeting in England.

Definite plans have been made for the trip to England next summer of the members of the American Society of Mechanical Engineers to meet at Birmingham July 26 to 29 with the Institution of Mechanical Engineers of Great Britain. The society holds an option until February 15 on the first cabin accommodations of the Celtic of the White Star line, sailing from New York July 16, and at present 192 members, with 143 ladies, have signified their intention of going, and 216 members and 166 ladies, additional, hope to attend. The party will arrive in Liverpool on Sunday, July 24, will spend the next day in that city, and on Tuesday morning will go by special train to Birmingham in time for the opening of the meeting. Among the officers of the American Society of Mechanical Engineers who now expect to attend are President George Westinghouse, past presidents Prof. F. R. Hutton, Oberlin Smith, Jesse M. Smith, Ambrose Swasey and Worcester R. Warner; vice-presidents: Prof. W. F. M. Goff, Col. E. B. Meier and F. M. Whyte; managers H. L. Gantt and James Hartness; Treasurer Wm. H. Wiley, and Secretary Calvin W. Rice.

PERSONAL.

Humphrey Bond of the metal firm of Vivian Bond & Co., 68 Beaver street, New York, is in Europe, where he will spend six weeks on business in the interest of his firm.

Fred H. Daniels, chief engineer and a director of the American Steel & Wire Company, has been decorated by King Gustaf of Sweden with the Cross of Knighthood of the Northern Star, in token of his work as an engineer and for courtesies extended to Swedish engineers in this country.

H. E. Kunzman, Pittsburgh, has been appointed manager of the Columbus Structural Steel Company. B. M. Freeman, who has been manager, has taken charge of the structural department and will look after operations.

Frederick Krebs has been elected a director of the Cambria Steel Company, succeeding Frank J. Firth, resigned. Mr. Krebs is general manager of sales of the company, having attained that position by steady advancement through a service with the company extending over a third of a century. He began as a clerk in the so-called "company's store" at the age of 16.

J. G. White & Co., 43 Exchange place, New York, announce that to assist in caring for their increasingly important irrigation and hydraulic work they have added to their previous large and experienced staff of hydraulic and irrigation engineers, with title of chief irrigation engineer, I. W. McConnell, recently supervising engineer, United States Reclamation Service.

Charles A. Moore of Manning, Maxwell & Moore, Inc., has been elected president of the Van Norden Trust Company, New York. Charles A. Moore, Jr., is one of the directors.

T. I. Stephenson has been elected president of the Knoxville Iron Company, Knoxville, Tenn. He has been with the company 30 years, beginning as an office boy. He now succeeds W. P. Chamberlain, resigned. The other officers are: Vice-president, H. S. Chamberlain, Chattanooga; secretary, O. A. Brown, Knoxville.

George W. Doran, heretofore inspector of boilers for the New York Central lines at the Brooks plant of the American Locomotive Company, at Dunkirk, N. Y., has been promoted to the office of assistant supervisor of boilers of the same lines. Martin Albright succeeds Mr. Doran at the Brooks plant.

S. Norton, general manager of Witherbee, Sherman & Co., at Mineville, N. Y., will address the Society of Engineers of Eastern New York Wednesday evening, February 9, in the new engineering building of the Rensselaer Polytechnic Institute on "The Iron Ores of New York State." The address will be illustrated by a number of lantern slides, showing underground workings as well as the mechanical department of the mines and concentrating mills of Witherbee, Sherman & Co.

C. J. Morgan, vice-president of the Taylor & Boggis Foundry Company, Cleveland, Ohio, will sail from San Francisco February 5 on the Cleveland for a trip round the world.

Tracy W. Guthrie, president of the Republic Iron & Steel Company; George G. McMurtry, chairman of the Board of Directors of the American Sheet & Tin Plate Company, and George Heard, president of the Natural Gas Company of West Virginia and vice-president of the Unity Oil Company, have been elected directors of the Pittsburgh Trust Company. Willis L. King, vice-president of the Jones & Laughlin Steel Company, has retired as a director of the Pittsburgh Trust Company owing to pressure of other business.

W. G. Brangham, formerly manager of the Chester Works of the American Sheet & Tin Plate Company, has been appointed general manager of the new tin plate plant of the Phillips Sheet & Tin Plate Com-

pany at Weirton, W. Va. The completion of this plant has been delayed considerably by the failure to receive an engine, delivery for which was promised some time ago.

Frederick W. Coxe, formerly sales agent of the Cambria Steel Company at Buffalo and at Philadelphia, has accepted the position of sales manager of the Crosby Company, Buffalo, N. Y.

W. A. Sibley has been elected president and general manager of the Sibley Machine Tool Company, South Bend, Ind., succeeding William Holland, who resigned to organize a company to engage in the jobbing foundry business in that city.

E. J. Little, who has been in charge of the publication department of the S. F. Bowser Oil Tank Company, Fort Wayne, Ind., has been made assistant sales manager. H. W. Fisher succeeds Mr. Little as editor of the *Bowser Boomer*.

A. H. Boyd, who has had charge of the motor sales department of the Fort Wayne Electric Company's business, has been promoted to be manager of the company's branch office in Philadelphia.

OBITUARY.

GENERAL WILLIAM F. DRAPER, Hopedale, Mass., until recently president of the Draper Company, builder of textile machinery, died January 28, aged 68 years. He was a native of Lowell, Mass., and much of his life was devoted to building up the great business at Hopedale. He saw active service in the Civil War and was promoted through successive commissions to the rank of brevet brigadier-general. He served in the Fifty-third and Fifty-fourth Congress, and was Ambassador to Italy from 1897 to 1900. He was a commander of the Loyal Legion of Massachusetts and was a member of the Army and Navy Club, Washington, the Algonquin Club of Boston and the Cacia Club of Rome.

GEORGE BRILL of the J. G. Brill Car Company, Philadelphia, died January 30, after an illness of several months, aged 62 years. He leaves a widow, one son and a daughter.

DAVID W. BINNS, a retired iron manufacturer, who for many years had a foundry at 56 Sandford street, Brooklyn, N. Y., died January 29, at his home in that city. He was a member of the Brooklyn Union League and the Manufacturers' Association of New York.

The Cleveland Foundrymen's Association.—At the annual meeting of this society, held at the Hollenden Hotel, Cleveland, Ohio, January 20, the following officers were elected for the ensuing year: President, W. C. Bruce, Bowler Foundry Company; vice-president, D. J. Kilby, Kilby Foundry Company; treasurer, W. D. Sayle, City Foundry Company; secretary, Philip Frankel; Executive Board: The president, vice-president, treasurer and N. S. Calhoun, Johnson & Jennings Company, and Omar N. Steele, American Shipbuilding Company.

The Southern Supply & Machinery Dealers' Association is preparing for its joint convention with the American Supply & Machinery Manufacturers' Association to be held at Jacksonville, Fla., April 5, 6 and 7. Arrangements have been made to have the headquarters of the joint convention at the Seminole Hotel. Special railroad rates will be secured for the delegates. The details in this respect are in charge of Alvin M. Smith of the Smith-Courtney Company, Richmond, Va.

The Upson Nut Company, Cleveland, Ohio, has placed an order with the Wellman-Seaver-Morgan Company for 11 Hughes gas producers for the steel plant which the former company will erect during the present year.

Canadian Industrial Affairs.

To Increase Nickel Production in Canada.

TORONTO, January 29, 1910.—The Mines and Minerals Committee of the Canadian House of Commons has entered upon an investigation into the country's nickel resources and the present condition of the nickel industry. Arthur Wilson, an expert, in giving evidence to the committee, suggested that it would be in the interest of the country generally if the deposits at Sudbury were worked on a larger scale. He thought that not only might an export duty be placed on nickel matter, but that the government ought in every way to foster the manufacture of nickel steel in Canada. It is expected that officials of the Canadian Copper Company will be summoned to give data as to the operation of the industry.

The committee's interest in this particular question appears to have been roused by allegations that the use of nickel is greatly restricted by the high price at which it is held. That the output could be immensely increased if the manufacturing capacity were enlarged is said to be beyond question by the great magnitude of the ore deposits. What the committee is seeking to ascertain is whether the price of nickel is kept unduly high because its production is controlled by a single corporation. If such is found to be the case, Parliament will doubtless be advised to take measures for remedying this state of affairs. It is not generally known that a law is already on the statute book authorizing the imposition of an export duty on nickel ore and nickel matte. It was passed in 1897, but its enforcement was left in the discretion of the government.

At the first meeting of the Commission for the Conservation of Canada's Natural Resources, held last week in Ottawa, Dr. Eugene Haanel, director of the Mines Branch of the Department of Mines, gave an address as to the importance of husbanding Canada's mineral resources. Touching on the nickel industry, he said: "Of what particular benefit are our nickel mines? We mine the ore, smelt it into matte, and export it from the country. The employment of an inconsiderable number of men is all we get out of it. Moreover, the process used is extremely wasteful."

He showed how easily the manufacture of finished nickel in Canada could be effected, and also declared necessary the discovery of a "more rational treatment of cobalt ores to reduce waste." Perhaps the establishment of well equipped government laboratories for research was the solution.

Notes.

An order was made by Justice Clute last week to stay proceedings on the winding up order against the Atikokan Iron Company, granted September 8, and discharging Joseph Dix Fraser, the provisional liquidator. Justice Clute's order was granted on the application of Mackenzie & Mann, who hold a large number of shares in the company. The petitioners said that nothing was done in the winding up proceedings because the shareholders procured the necessary funds to satisfy all the debts of the company and to continue the business, and that all such debts have since been paid except a claim made by Roberts & Co. for alleged balance of architects' fees in connection with the building of the works.

In the House of Commons January 19 Mr. Boyce, member for West Algoma and a resident of Sault Ste. Marie, made a strong plea in favor of continuing the bounties on iron and steel.

C. A. C. J.

A New Can Factory at Canonsburg, Pa.—The Continental Can Company, which now operates plants for the manufacture of tin cans at Syracuse, N. Y.; Baltimore, Md., and Chicago, has started work on the erection of a new can factory, 82 x 250 ft., near the plant of the Standard Tin Plate Company, Canonsburg, Pa. The new plant is being erected with the object of tak-

ing care of the Central Western trade of the Continental Company, and also for making a sanitary tin can for which patents have recently been granted to the company. The buildings will be completed about April 1, and the making of cans will start about June 1. The plant will consume about 100,000 boxes of tin plate per year, all of which will be furnished by the Standard Tin Plate Company. This latter company now operates 10 hot tin mills at Canonsburg, with an annual capacity of 750,000 boxes of tin plate, so that, while a fair proportion of its output will go to the Continental Can Company, it will still have about 650,000 boxes to supply its general trade.

Consolidation of the Chamber of Commerce and the Manufacturers' Club at Buffalo.

—By separate vote of the Buffalo Chamber of Commerce and the Buffalo Manufacturers' Club taken last week the two organizations were consolidated, and the unified organization will hereafter be known as the Chamber of Commerce and Manufacturers' Club of Buffalo. The united body has a membership of 1700, and will be a very strong organization, composed as it is of the two largest commercial bodies of the city. It is expected that the amalgamated association will become a much greater factor in the field of civic and commercial progress than would be possible by the maintenance of two separate and in some respects rival organizations. In the programme for extension and increased activities contemplated by the combined organization is the formation of a number of new bureaus and departments, among which are the following: An industrial bureau, for the locating of new industries in Buffalo; a manufacturers' bureau, to foster and help industries already located in the city and suburbs; a traffic bureau, to secure the best possible freight rates and promptest transportation service, and an export bureau, to aid in building up the city's rapidly growing export trade.

Good Work at Bellaire Furnaces.—Excellent records were made in December by the Bellaire, Ohio, stacks of the Carnegie Steel Company. The No. 1 furnace, which is 76 ft. high by 19 ft. bosh and 12½ ft. hearth diameter, produced 12,762 tons, or a daily average of 411.4 tons. The coke consumption was 2071 lb. per ton of iron, while 955 lb. of limestone was used. The average daily product per 100 cu. ft. capacity was 3.584 tons, or 3.53 tons per sq. ft. of hearth area. The volume of air was 35,110 cu. ft. per min. Furnace No. 2, which is 75 ft. 2 in. high, with bosh and hearth diameters of 19 ft. and 12 ft. respectively, produced 12,629 tons, or an average of 407.4 tons per day. The coke consumption per ton of iron was 2024 lb., while 921 lb. of limestone was used. The daily production was 3.65 tons per 100 cu. ft. capacity and 3.602 tons per sq. ft. of hearth area. The volume of air was 34,023 cu. ft. per min. The record day's product at No. 1 furnace was 495 tons and at No. 2 furnace 459 tons.

Reorganization of the Union Furnace interests in Ironton, Ohio, taken over in October by Rogers, Brown & Co., has been effected with J. K. Pollock as president, D. B. Meacham, vice-president, H. E. Turner, secretary and treasurer, and S. S. Littlejohn, assistant secretary. The capital is \$300,000, all paid in. Union Furnace, which has a capacity of 150 tons a day, is running on basic.

The ninth annual dinner of the alumni of Stevens Institute will be held at the Hotel Astor, New York, on the evening of February 12. Among the speakers will be the following: Dr. Alexander C. Humphreys, president of the Stevens Institute; Dr. Pritchett of the Carnegie Foundation, and Colonel Harvey, editor of *Harper's Weekly*.

The Scrap Iron Ruling Revised.

The Treasury Department, after a thorough investigation of the subject, has modified its position with regard to the duty on scrap iron. A new decision was issued January 28, in the form of a letter to the collector of customs at Philadelphia, Pa., as follows:

"Since the publication of the Department's instructions to you of October 23, 1909 (T. D. 30,063), relative to scrap iron and scrap steel, the Department has received many requests from persons interested in the business of remanufacturing these commodities for further consideration thereof.

"In determining the interpretation to be placed upon paragraph 118 of the tariff act of 1909, the important point to be borne in mind is the intention of the Congress, as indicated by the change in the rate of duty upon scrap from \$4 to \$1 per ton. It is not only a matter of common knowledge, but also within the specific knowledge of the Department, that Congress intended scrap iron and scrap steel to be imported with a duty of \$1 per ton; and that Congress did not intend to permit the entry as scrap, of iron and steel not really waste or refuse. In order to give full effect to the primary intent of the statute—i. e., the lowering of the tariff on scrap, the defining clause must be interpreted in a manner that will not render nugatory the principal clause immediately preceding it. In other words, a proper and just construction demands that more stress be laid upon the clause by which the duty is lowered than upon the clause excepting certain materials from the operation of the paragraph. The Department is of opinion that the phrase, 'Fit only to be remanufactured by melting and excluding pig iron in all forms,' was intended by Congress to be a more accurate definition of the term, 'scrap iron and scrap steel,' than was contained in the act of 1897, and was not intended in any way to be a further limitation thereof.

"After a careful investigation into the methods of remanufacturing waste or refuse iron or steel now in operation, the Department is of opinion that all scrap iron and scrap steel is dutiable at \$1 per ton except such as can be profitably remanufactured by a process of rolling, hammering or cutting, or any other process which does not include the complete change of form of the material by fusion caused by the application of heat. T. D. 30,063 is hereby modified accordingly."

Hubbard & Co.'s Extensions.—Hubbard & Co. have recently acquired 10 acres of land adjoining their plant on Butler street, Pittsburgh, on which they will erect new buildings, including a steel and brick building, 100 x 250 ft., to be fitted with bolt heading and threading machinery and drop hammers for the manufacture of bolts, cross arm braces, &c., and a new galvanizing plant, 150 x 250 ft. of steel and brick construction. The latter will contain two galvanizing pots of about 60 to 70 tons capacity, which will practically double the present output. Hubbard & Co. recently bought the Pierce Company's business at Elkhart, Ind., manufacturer of various specialties, and it will be moved to Pittsburgh, into a building 50 x 150 ft. C. L. Pierce, Jr., will be manager of this department.

The American Roll & Foundry Company's Improvements.—The American Roll & Foundry Company, Canton, Ohio, is adding to its foundry capacity a steel and brick building, 100 x 130 ft., to contain a 40-ton electric traveling crane, air furnaces and drying ovens, thereby doubling its foundry capacity. It recently erected a 60 x 60 ft. addition to its roll shop, which is being fitted with four roll lathes of its own manufacture, from 28 to 60-in. capacity, and other equipment. The power plant will also be doubled by the installation of a boiler, engine and generator, for

which it will send out inquiries shortly. The company has established a Pittsburgh sales office in the German National Bank Building. It has enough business on its books to insure operations for several months.

The Westinghouse Industries.

The Westinghouse interests at Pittsburgh have sent out a diary and memorandum book for 1910, which contains much valuable information relating particularly to electrical work. A complete list of the various industries owned and operated by the Westinghouse interests is given as follows:

Westinghouse Electric & Mfg. Company, Pittsburgh.
Westinghouse Air Brake Company, Wilmerding, Pa.
American Brake Company, St. Louis.
Westinghouse Machine Company, East Pittsburgh, Pa., and Attica, N. Y.
Union Switch & Signal Company, Swissvale, Pa.
Westinghouse Lamp Company, Bloomfield, N. J.
Bryant Electric Company, Bridgeport, Conn.
Perkins Electric Switch Mfg. Company, Bridgeport, Conn.
Pittsburgh Meter Company, East Pittsburgh, Pa.
R. D. Nuttall Company, Pittsburgh.
Westinghouse Automatic Air & Steam Coupler Company, St. Louis.
Nernst Lamp Company, Pittsburgh.
Westinghouse Traction Brake Company, Wilmerding, Pa.
Cooper Hewitt Electric Company, New York City.
Westinghouse Foundries Company, Trafford, Pa.
Westinghouse Brake Company, Ltd., London, England, and Hanover, Germany.
British Westinghouse Electric & Mfg. Company, Ltd., Manchester, England.
Société Anonyme Westinghouse, Le Havre, France.
Westinghouse Electricitäts-Aktiengesellschaft, Berlin, Germany.
Canadian Westinghouse Company, Ltd., Hamilton, Canada.
Compagnie Internationale Pour le Chauffage des Chemins de Fer Systeme Heintz, Ltd., London, England.
Compagnia Italiana Westinghouse Del Freni, Turin, Italy.
Société Electrique Westinghouse De Russie, 11 Nevsky Prospect, St. Petersburg, Russia.
Westinghouse Cooper Hewitt Company, Ltd., 2 Norfolk street, Strand, W. C., London, England.
Société Anonyme Westinghouse St. Petersburg, 2 Priloukain, St. Petersburg, Russia.
Westinghouse Electric Company, Ltd., London, England.
Westinghouse Metal Filament Lamp Company, Ltd., London, England.
Holland-American Construction Company, London, England.
Società Italiana Westinghouse, Genoa, Italy.
Traction & Power Securities Company, Ltd., London, England.
Westinghouse Metallfaden, Gluehlampenfabrik, Gesellschaft, m. b. H., Vienna, Austria.

Indiana Industrial Conditions.

Melville W. Mix, president of the Dodge Mfg. Company, Mishawaka, Ind., made an interesting report as chairman of the Committee on Mechanical Engineering of the Indiana Engineering Society, which held its annual convention in Indianapolis, January 14. He charged that manufacturers do not try to make expert workmen out of their employees, but that they put men to work in their shops whether they have any ability or not, just so that they can turn out the work. He expressed the fear that this practice will have a deplorable effect on industrial progress.

His report also gave a comprehensive review of trade conditions in Indiana, showing that the manufacturing establishments throughout that State are in active operation, with many working overtime and with the number of factory employees now engaged running ahead of any previous record. He expressed the belief that 1910 will prove to be the banner year of manufacturing production. He paid a high tribute to the natural resources and strategic position of Indiana, claiming that no reason exists why the State should not occupy a commanding position in the engineering and manufacturing world.

John Mohr & Sons, Chicago, are beginning the construction of two 400-ton metal mixers for the Indiana Steel Company, to be installed in the Gary plant.

NEWS OF THE WORKS.

Iron and Steel.

One of the three blast furnaces in the Thomas, Ala., group of the Republic Iron & Steel Company has been blown out for relining.

The Lockhart Iron & Steel Company, McKees Rocks, Pittsburgh, is installing an electric 15-ton traveling crane to serve for mill and yard work, with lifting magnet attachment, and also a 10-ton electric traveling crane.

The Sharon Steel Hoop Company, Sharon, Pa., has started its new No. 6 open hearth furnace, which is working very satisfactorily.

The Woodward, Ala., Iron Company is completing an electric haulage system, including a powerful motor driven hoist, also a gyratory breaker plant for crushing flux.

General Machinery.

Mackintosh, Hemphill & Co., Pittsburgh, recently shipped to the Portsmouth Steel Company, Portsmouth, Ohio, a 42 x 60 in. reversing mill engine for direct connection with a 35-in. blooming mill, and have also completed a shipment this week to the Forged Steel Wheel Company, Butler, Pa., an interest of the Standard Steel Car Company, of a pair of 55 x 60 in. direct reversing engines, which will drive a new slabbing mill to be installed in its new open hearth steel plant.

The Standard Bridge Tool Company, Ferguson Building, Pittsburgh, has been awarded a contract by the Pressed Steel Car Company, McKees Rocks, Pa., for a Thomas spacing table 120 in. by 50 ft. Three 120-in. multiple punches and two 120-in. gange punches for the table will be built by the Cleveland Punch & Shear Company, Cleveland, Ohio. Orders filled last week for Thomas tables were: Pullman Company, Chicago, two tables with angle punches; Lackawanna Bridge Company, Buffalo, two tables.

Silent chain drive installations were recently made by the Morse Chain Company, Westinghouse Building, Pittsburgh, in the works of the Ward-Corby Company, Chicago, where seven outfits were placed. Four were of 35-hp. each and three of 15-hp. In the power plant of the South Penn Building Company, Uniontown, Pa., four 15-hp. chain drives were placed on motor driven woodworking machinery.

The Titlow Waste Heat Power Company, Uniontown, Pa., with a capital of \$150,000, has been granted a charter to manufacture steam boilers, generators and other machinery for the utilization of waste heat from coke ovens.

The Morgan Coke Machine Company, Uniontown, Pa., with a capital stock of \$300,000, has been granted a charter to manufacture machinery for drawing and leveling coke and leveling and loading coal.

H. J. Koontz, Century Building, Pittsburgh, has recently made sales of machinery and equipment as follows: La Follette Iron Company, La Follette, Tenn., a 14 x 16 in. Erie City steam engine; Sagamore Mining Company, Middlesboro, Ky., a Jeffrey 17 A mining machine; an 85-hp. Walrath gas engine direct connected to a Westinghouse generator, to parties in Wheeling, W. Va.; Hazel-Atlas Glass Company, Clarksburg, W. Va., an 85-hp. Walrath gas engine, and a 55-hp. gas engine to parties in Mannington, W. Va.

Foundries.

The United States Cast Iron Pipe & Foundry Company states that the fire at its Columbus, Ohio, plant did not destroy any of the buildings further than damaging the skylights and part of the roof. The company expects simply to make repairs, taking out the burned part and renewing the buildings, which will remain the same as heretofore.

The Albion Malleable Iron Company, Albion, Mich., will build a new annealing room, 150 x 300 ft., also an additional pattern vault, 60 x 120 ft., work to commence at once.

The Vulcan Iron Works, New Britain, Conn., is building a foundry 110 x 203 ft., which is nearing completion. The entire machinery equipment has been purchased. It expects to install a large air furnace, which will increase its output nearly one-half.

The Phoenix Iron Works, Portland, Ore., is now operating a custom foundry, the capacity of which will eventually be considerably enlarged.

The Peden Iron & Steel Company, Houston, Texas, is having a large run of business and some extension of its facilities will need to be made during the year.

The American Radiator Company, Chicago, will build in Kansas City a large foundry and finishing shop, with probably a complete power plant, although electric current for operating motors may be purchased. Full details may be obtained a little later. This is the plant mentioned briefly some weeks ago. It is to be 112 x 1042 ft., with power house probably 45 x 93 ft.

A new plant, electrically operated, is to be built this spring by the Peninsula Stove Company, Detroit, Mich., probably including a large malleable and gray iron foundry.

The Commonwealth Steel Company, St. Louis, Mo., is completing an addition to its foundry which will increase the capacity about 40 per cent.

Bridges.

The citizens of Syracuse, N. Y., are preparing a petition to be forwarded to the State Legislature requesting an appropriation of \$500,000 for the purpose of changing all bridges over the barge canal between Oswego and Syracuse from fixed to movable bridges.

The Puget Sound Iron & Steel Company is moving into its new plant on the Puyallup River, near Tacoma, Wash. This company will be in the market for some equipment at various periods during the year. The new buildings are not yet completely furnished, but construction is sufficiently advanced to permit of their use.

Power Plant Equipment.

W. B. Campbell, Toppenish, Wash., has organized the Submerged Power Wheel Company to manufacture a new type of hydraulic turbine.

A reorganization of the Ewald Iron Works, Louisville, Ky., has been effected, with \$500,000 capital, under the name of the Ewald Iron Company. The equipment of the plant will be improved and some extensions are to be entered upon later.

Contract for the boilers to be installed in the new municipal power plant at Plaquemine, La., has been let to the Casey & Hedges Company, Chattanooga, Tenn.

The plant of the United States Radiator & Boiler Company, West Newton, Pa., will be enlarged shortly and some new equipment is being provided for.

The Camden Iron Works is low bidder on pumping engines for the Park View sewage station at Detroit, Mich., with Allis-Chalmers Company next.

The Marine Iron Works, St. Johns, Ore., has recently taken a large contract for Government work. Later in the year some additional equipment, including electric motors, will probably be provided for this company's plant.

The Sumner Iron Works, Everett, Wash., is finding a particularly large sale at present for steam boilers and settings.

A large factory for the manufacture of gasoline engines is to be erected at Niagara Falls, N. Y., by the Stickney Gasoline Engine Company of St. Paul, Minn. The same company will also establish a Canadian branch manufactory at Brantford, Ont.

At the annual meeting of the Brownell Company, Dayton, Ohio, January 21, the following were elected directors: C. H. M. Atkins, J. M. Crawford, W. B. Gebhart, Chas. A. Hinsch, Samuel E. Hilles, John H. Gibson, A. H. Kemper, A. Clifford Shinkle, W. H. Stewart, George Puchta and J. H. Coyert. A. H. Kemper was re-elected president and C. A. Hinsch, president of the Fifth-Third National Bank, Cincinnati, vice-president. Most of the directors are Cincinnati business men.

Fires.

Fire destroyed the hardware manufacturing plant of Snow & Petrell, New Haven, Conn. The estimated loss is \$35,000.

The tinware plant of the Saal-Bloom Company, New Orleans, La., was burned January 25, the loss being about \$70,000.

The boiler room, sawmill and paint shop of the Champlain Transportation Company, Shelburne Harbor, Vt., was destroyed by fire January 25.

The Lee Foundry Company, Anniston, Ala., suffered a \$6000 loss by fire January 25.

Miscellaneous.

The H. D. Miller Company, recently incorporated by H. D. Miller, H. D. Close and A. N. Jones, and established at 323 Liberty avenue, Pittsburgh, where it has offices and a stock room, has secured the agency for the sale of rustproof paints for structural steel, stacks, tanks, &c., made by the Heath & Milligan Company, Chicago, in parts of Ohio, West Virginia and Pennsylvania, and also represents the Asbestos Protected Metal Company of Canton, Mass., in that territory. The H. D. Miller Company intends to handle paints, varnishes, hardware, builders' supplies, &c.

The Buick Motor Company, Flint, Mich., is putting in service water works of its own which include one of the largest pumping plants in the country, outside of the steel mills, to be used purely for industrial purposes.

The Numa Rock Drill Sharpener Company, Salt Lake City, is placing many of its tools in the Southwest, including Mexico. A large order was recently secured from the Cananea Consolidated Copper Company, Cananea, Mex.

An automatic engine and electric generator of about 100 hp. will be bought this month by the Garden City Plate Mfg. Company, Chicago, Ill.

The Ferrofix Brazing & Machine Works, Seattle, Wash., which has recently been working both day and night shifts, will be compelled to provide for some enlargement of the plant. Automobile repair work is particularly urgent.

The Peerless Machine Company, Easton, Md., has passed under the control of the Geiser Mfg. Company, Harrisburg, Pa., and some improvements may be made in the plant.

The Smith Automobile Company, Topeka, Kan., will be in the market this year for some additional machinery to provide for a largely increased output made necessary by the demand

for its machines. The capital of the company has just been extended to cover the projected improvements.

The Kalamazoo Railway Supply Company, Kalamazoo, Mich., which has put on the market an improved pressed steel wheel for hand cars, is preparing to considerably enlarge the year's output, and some additional equipment will be provided for in the near future.

The Flour City Ornamental Iron Works will erect an addition to its plant at Minneapolis, Minn.

The Woodstock Safety Chuck Company, Woodstock, Ill., recently organized, advises that it is now in running order. The officers of the company are: W. L. Proconler, president; J. J. Stafford, vice-president; W. E. Miller, secretary; John M. Hoyt, treasurer.

The Lorenson Mfg. Company, Rock Island, Ill., capitalized at \$55,000, has secured a factory building which it is equipping for the manufacture of a patent field mower. It is the intention of the company to erect a foundry, 40 x 60 ft., adjoining the building now occupied. The following are the officers of the company: Carl Lorenson, president; Frank Juhl, vice-president; John Lorenson, secretary; A. N. Nelson, treasurer.

The Detroit Gear Grinding Company, Detroit, Mich., has let contract for a three-story factory building, 62 x 104 ft., at East Grand Boulevard and Chene street.

The Grabowsky Power Wagon Company, Detroit, Mich., has completed plans for the erection of a two-story factory, 62 x 290 ft., at Mt. Elliott avenue and the Transfer Railroad, reinforced concrete and structural steel construction. Max H. Grabowsky, manager, 68 and 72 Champlain street.

The Packard Motor Car Company, Detroit, will add to its plant at East Grand Boulevard and the Belt Line a forge and machine shop, 80 x 360 ft., one story, and 80 x 140 ft., respectively. The same company has recently let contract for an additional factory, 60 x 242 ft., five stories, and for an additional fifth story to an adjoining factory building, 60 x 323 ft.

The Auto-Butter Machine Mfg. Company of New York has established its manufacturing plant at North Tonawanda, N. Y., in the factory formerly occupied by Wm. Sloat on Sweeney street.

The Van Dyke Motor Company, recently organized at Detroit, Mich., with a capital of \$1,000,000. Frank G. Van Dyke, president, 114 Rivard street, has had plans prepared for a manufacturing plant 50 x 500 ft., one and two stories, which it will build at Leverett street and the Michigan Central Railroad.

The Michigan Wire Cloth Company, Detroit, Mich., will build an extensive addition to its plant and increase its equipment largely.

The Long Mfg. Company, Detroit, Mich., is erecting a manufacturing plant at Cass and Amsterdam avenues. The main building will be 60 x 320 ft., two stories; foundry building 32 x 85 ft., one story.

The Indianapolis Auto Top & Rubber Tire Company has been organized at Indianapolis, Ind., and incorporated with \$15,000 capital stock, to manufacture autos, auto tops and tires. The directors are F. L. Palmer, E. E. Wiker, Eli Hendricks and Lee Browders.

The R. J. Irvin Mfg. Company, Indianapolis, Ind., maker of auto fronts, has increased its capital stock to \$75,000.

The Electrical Supply Company, Fort Wayne, Ind., has increased its capital stock from \$10,000 to \$25,000. M. B. Larimer is president.

The Michigan Magneto Company has been organized at Indianapolis, Ind., and incorporated with \$15,000 capital, to manufacture magnetos, ignition devices, stationary engines and marine engines. The directors are Albert G. and Henry G. Cox and Blanche Walton Cox.

The Standard Automobile Company has been organized at Wabash, Ind., with \$500,000 capital stock, and is equipping a factory building. The St. Louis Car Company, St. Louis, Mo., is establishing the plant.

The Remy Magneto Company of Anderson, Ind., took orders at the New York Automobile Show for 28,500 magnetos of the 1911 type from two automobile manufacturing companies, and they took options on 12,500 additional magnetos. This company supplies the Buick and the Overland automobile companies, said to be the two largest users of magnetos in the world. The sales referred to are the largest ever made by the Remy Company so far ahead.

The American Pulley Company, Philadelphia, which lately bought about 5 acres to meet its foundry requirements, states that it has not at present plans for building upon the new property. It is finishing an addition, 50 x 120 ft., on land previously owned.

The Columbia Enameling & Stamping Company, Terre Haute, Ind., has filed notice of its increase of capital from \$500,000 to \$1,000,000.

The Armstrong Cork Company, Camden, N. J., is increasing its power equipment and has placed an order with the Allis-Chalmers Company, Milwaukee, Wis., for a gas engine generator

unit. The engine is 18' x 24 in. tandem horizontal double acting, and will operate on producer gas. Two igniters will be provided at each end of the cylinders to insure an explosion of the mixture. The engine will be started with compressed air, which is stored in suitable tanks. A 200-kw. 250-volt 200 rev. per min. direct current generator will be direct connected to the engine. This is a second order.

The Rhineland Machine Works Company, 50 Church street, New York City, states, with regard to its recently noted incorporation, that it is devoting itself exclusively to representing its factory at Disseldorf, Germany, in the importation of ball bearings, forgings, &c.

The Corbin Screw Corporation, New Britain, Conn., has let the contract to the New Britain Machine Company for making a large part of the machinery equipment for its new factory building. The new building will be one-third as large as the main building itself.

The Brown-Lipe Gear Company, Syracuse, N. Y., has been reorganized under the same management and will hereafter be known as the Brown-Lipe-Chapin Company. The reorganized company will double the size of the present plant by the erection of a large factory building of reinforced concrete, for which a large amount of additional machinery equipment will be required.

The Racine Mfg. Company, Racine, Wis., has resumed operations in practically the same proportions as before its recent fire. It is not the intention of this company to move its plant from Racine, as was reported in the newspapers.

The General Fireproofing Company, Youngstown, Ohio, has received an order from the B. F. Goodrich Company, Akron, for 1200 metal lockers and an entire office outfit of metal desks, aggregating about \$20,000; also an order from the American Steel & Wire Company for 4000 lockers to be delivered at the several offices of the corporation for the use of office employees and department foremen.

The Huron Steel & Iron Company in Receivers' Hands.—The Huron Steel & Iron Company, Norwalk, Ohio, was placed in the hands of receivers January 27 through proceedings started in the United States Court in Toledo by the Norwalk National Bank, which took judgment against the company on a cognovit note for \$6034. E. G. Martin of Norwalk and the Cleveland Trust Company were appointed receivers. The latter company is trustee for the \$1,500,000 bonds which the steel company has outstanding. The Huron Steel & Iron Company was formed about a year ago as a reorganization and consolidation of the Huron Steel & Iron Company and the William Kavanaugh Company. About two weeks ago the plant was shut down because of lack of working capital. A few days later, before the receivership, the steel plant was leased until July 1 to the Galesburg Coulter Disk Company, Galesburg, Ill., a large customer of the company.

The United States Department of Agriculture, Division of Publications, Jos. A. Arnold, editor and chief, has issued an interesting statement on our exports of farm products, from which the following extracts are taken: The last half century has seen a great increase in the exports of farm products from the United States. From an average of \$150,000,000 a year in the five-year period, 1851-1855, the agricultural exports rose to an average of \$875,000,000 a year in 1901-1905, and in two subsequent individual years (1907 and 1908) surpassed \$1,000,000,000. Not only have such exports increased, but they have increased much faster than the population. In 1851-1855 the average value per capita of the agricultural exports of the United States was \$5.85; in 1901-1905 it was \$10.88, and since 1905 it has been still greater.

Reported Steel Works and Blast Furnace Merger.—Reports which the principals will neither confirm nor deny have been published regarding a consolidation of the Alan Wood Iron & Steel Company, Ivy Rock, Pa., and the Swedeland furnaces of Richard Heckscher & Sons Company, Swedeland, Pa. Should such a deal be made it is quite probable that a bridge over the Schuylkill River, connecting the two plants, would be erected for the purpose of transporting hot metal from the furnaces to the steel plant.

December Iron and Steel Exports and Imports.

The December report of the Bureau of Statistics of the Department of Commerce and Labor completes the statistics of exports and imports for the calendar year 1909. Both exports and imports increased considerably as compared with 1908, the imports showing a much greater relative increase than the exports. The total value of iron and steel and manufactures thereof, not including ore, exported in 1909 was \$157,680,331, against \$151,113,114 in 1908. The total value of similar imports in 1909 was \$30,516,536, against \$19,957,385 in 1908.

The total weight of the exports of commodities for which quantities are given was 1,243,466 gross tons in 1909, against 964,237 tons in 1908. The total weight of similar imports was 362,501 gross tons in 1909, against 205,842 tons in 1908.

The exports in the month of December showed an increase in value over those of November, the December value of the exports of iron and steel and manufactures thereof, not including ore, having been \$15,075,183, against \$14,434,690 in November.

The exports of commodities for which quantities are given aggregated 137,675 gross tons in December, against 115,940 tons in November. The details of the exports of these commodities for December and for the full year 1909 were as follows:

	December.		Twelve months ending December.	
	1909.	1908.	1909.	1908.
Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	4,076	4,732	61,999	46,696
Scrap.....	403	843	25,300	21,834
Bar iron.....	1,249	548	13,536	8,223
Wire rods.....	2,361	911	20,142	7,412
Steel bars.....	7,322	4,592	74,423	43,881
Billets, blooms, &c.....	3,625	7,893	104,862	112,177
Hoop, band, &c.....	600	454	3,856	4,339
Steel rails.....	53,151	10,243	299,540	196,510
Iron sheets and plates.....	9,697	4,505	75,305	44,100
Steel sheets and plates.....	11,315	6,922	104,742	60,892
Tin andterne plates.....	1,130	284	9,327	11,878
Structural iron and steel.....	8,515	9,938	90,830	116,881
Barb wire.....	5,577	7,614	70,812	*34,718
Wire.....	7,406	4,339	78,520	*101,426
Cut nails.....	704	734	9,935	7,023
Wire nails.....	3,066	3,331	30,065	26,509
All other nails, including tacks.....	713	706	7,463	5,377
Pipes and fittings.....	16,765	9,065	162,140	114,361
Totals.....	137,675	77,654	1,243,466	964,237

* Figures are for July to December, inclusive.

The exports by months for the entire year were as follows, showing that December made a record:

	Tons.		Tons.
January.....	70,085	July.....	100,681
February.....	84,800	August.....	105,895
March.....	94,523	September.....	97,393
April.....	100,904	October.....	111,802
May.....	109,977	November.....	115,940
June.....	114,751	December.....	137,675

The imports of commodities for which quantities are given aggregated 66,054 gross tons in December, against 63,917 tons in November. The details of the imports of this class of products for December and for the full year 1909 are as follows:

	December.		Twelve months ending December.	
	1909.	1908.	1909.	1908.
Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	28,607	10,330	174,988	92,202
Scrap.....	22,090	1,061	63,504	5,090
Bar iron.....	2,682	1,106	19,206	19,671
Rolls.....	728	48	1,513	1,719
Billets, bars and steel in forms n.e.s.....	4,886	2,204	19,287	11,212
Sheets and plates.....	764	393	4,720	2,628
Tin andterne plates.....	5,195	2,475	62,593	58,489
Wire rods.....	590	651	10,544	11,208
Structural iron and steel.....	520	670	6,146	3,623
Totals.....	66,054	18,938	362,501	205,842

The details of the imports by months, also showing a record for December, are as follows:

	Tons.		Tons.
January.....	19,782	July.....	20,136
February.....	19,418	August.....	22,121
March.....	20,714	September.....	32,166
April.....	17,772	October.....	34,290
May.....	18,352	November.....	63,917
June.....	19,402	December.....	66,054

The imports of iron ore in December were 222,609 gross tons, against 174,976 tons in November, 179,505 tons in October, 164,613 tons in September, 209,855 tons in August, 172,316 tons in July, 124,714 tons in June, 97,393 tons in May, 74,782 tons in April, 108,676 tons in March, 61,749 tons in February and 105,232 tons in January. Of the December imports 117,839 tons came from Cuba, 52,543 tons from Europe, 42,174 tons from British North America and 10,053 tons from other countries. The total imports of iron ore for the full year 1909 were 1,696,411 gross tons, against 776,898 tons in 1908 and 1,229,168 tons in 1907.

Iron and Steel Interests in the Oliver Building, Pittsburgh.

For some years many of the larger iron and steel concerns in Pittsburgh have had their offices in the Frick Building, Frick Building Annex, Lewis Building, German National Bank Building and several other large structures. With the completion of the new 25-story Oliver Building, being erected by the Henry W. Oliver Estate on Smithfield street, and which is expected to be ready for occupancy April 1, more of the leading iron and steel concerns will be located there than in any other office building in Pittsburgh. Among those having already rented offices in the Oliver Building are the following:

Aluminum Cooking Utensil Co.	Knowles Steam Pump Works.
American Road Machinery Co.	Laidlaw-Dunn-Gordon Co.
Banning, Cooper & Co., Ltd.	Mesta Machine Company.
Bessemer Coke Co.	Midvale Steel Co.
Braeburn Steel Company.	National Labor Tribune.
Bygate, Chas. S.	Peacock, Alexander B.
Carlin, Thomas, Sons' Co.	Pittsburgh & Eastern Coal Co.
Cherry Valley Iron Co.	Pneumatic Machine Co.
Corrigan, McKinney & Co.	Republic Iron & Steel Co.
Crocker-Wheeler Co.	Richards Coal Mining Co.
Crucible Steel Co. of America.	Shenango Furnace Co.
Dayton Pipe Coupling Co.	Shenango Steamship Co.
Deane Steam Pump Co.	Shenango Steamship & Transportation Co.
Fort Pitt Engineering Co.	Snow Steam Pump Works.
Hanna, M. A., & Co.	Snyder, W. P., & Co.
Hickman, Williams & Co.	Snyder, W. P.
Hillman, J. H., & Son.	United States Weather Bureau.
Hillman, J. H.	United States Cast Iron Pipe & Foundry Co.
Hillman, J. H., Jr.	United Iron & Steel Co.
Hillman, Ernest.	Union Coke Co.
Hirsch, William L.	United States Aluminum Co.
Iron City Sanitary Mfg. Co.	Verona Tool Works.
Irwin, Jr., Henry.	Whitney-Kemmerer Co.
Jamison Coal & Coke Co.	Worthington, Henry R.
Jamison, Jno. M.	
Kebler, Eliot A.	
Kier Fire Brick Co.	

Announcement is made of the consolidation of *Industrial Engineering*, heretofore published at Pittsburgh, and the *Engineering Digest*, New York. The offices will be at 220 Broadway, New York. Robert T. Kent, editor of *Industrial Engineering*, becomes managing editor of the consolidated magazine. Harwood Frost, who was the founder of the *Engineering Digest* and one of its editors, will now devote himself entirely to the *Engineering News*.

The J. F. Young Company, Thirty-fourth street and Allegheny Valley Railway, Pittsburgh, succeeds J. F. Young, deceased, manufacturer of portable gravel roofing and roofing materials, of which H. D. Young, a son of the founder, is president and treasurer.

The Iron and Metal Trades

The iron trade shows the working of cross currents. The mills continue to receive specifications in large volume, and though there is quietness in some finished lines, consumption, as indicated by current shipments, is at a rate that would be remarkable except by comparison with the buying of a few months ago.

In the wire trade, for example, specifications are good, and the leading producer has 97 per cent. of its theoretical capacity at work. Naturally there is some stocking against the heavier buying movement looked for at the breaking up of winter. The structural industry, too, with the large number of smaller building operations coming forward, is making an excellent showing, with railroad buying so conspicuously lacking.

The pig iron market shows further weakness under the pressure of iron for delivery in the next few months, stocks having accumulated in some sections. Buyers seem to have put aside for the time being negotiations for iron for the second half of the year, waiting for clearer indications as to the relation of supply and demand.

The weakness in basic iron in the Central West is attributed to the existence of stocks, estimated at 60,000 tons, owned by speculators. Such iron has been offered at \$16.50, and lower at Valley furnace for early shipment. Furnaces are asking \$17 for forward delivery. Sales of basic iron are also reported in the Birmingham District. In eastern Pennsylvania one 6000-ton sale was made for the second quarter. For that delivery as low as \$18.35 has been done, though most furnaces are holding at \$18.75 for second and third quarters.

In foundry iron comparatively little has been done in any district. The buying in the previous week was largely by malleable foundries. In New England sales of Virginia foundry irons have been made at 50 to 75 cents below the prices of a few weeks ago, a freight reduction effective February 1 being one factor in this competition with Buffalo furnaces.

Eastern steel works report further inquiry for billets from the Central West, a condition that holds prices firmly, though there has been a gradual working out of the famine of a few months ago.

The principal rail business is the completion of the Baltimore & Ohio purchases, close to 50,000 tons being divided between Chicago District and Pittsburgh mills, while an eastern Pennsylvania mill secures about 25,000 tons. The Philadelphia & Reading has bought 5000 tons additional. It is estimated that the buying for the Harriman lines, including the Illinois Central, since June, 1909, has amounted to no less than 470,000 tons. Of this 48,000 tons of open hearth rails was bought in January, 32,000 tons to be rolled in the Chicago District and 16,000 tons in Alabama.

An index to larger activity in the foundry trade is the appearance of inquiries in the New York machinery market for \$1,000,000 worth of equipment for machine shop work. Not in three years has there been such a volume of prospective business before the machinery trade.

Reports from Great Britain indicate a distinct revival in the iron trade, with advancing prices, notably in steel-making iron.

A sale of 20,000 tons of bloom crop ends has just been made at Middlesbrough, England, for export to the United States. Other forms of old material have been bought more freely in the past week in view of the decision making practically all scrap dutiable at \$1 a ton. Owing to heavy receipts of foreign scrap, which Eastern mills have had to take forward from vessels, shipments of domestic scrap to such mills have been held up, causing some heaviness in that market.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.

	Feb. 2, 1910.	Jan. 26, 1910.	Jan. 5, 1910.	Feb. 3, 1909.
PIG IRON , Per Gross Ton:				
Foundry No. 2, standard, Philadelphia.....	\$18.75	\$19.00	\$19.00	\$17.25
Foundry No. 2, Southern, Cincinnati.....	17.25	17.25	17.25	16.25
Foundry No. 2, local, Chicago.....	19.00	19.00	19.00	17.00
Basic, delivered, eastern Penn.....	18.50	18.75	18.75	16.75
Basic, Valley furnace.....	16.50	16.50	17.00	15.50
Bessemer, Pittsburgh.....	19.90	19.90	19.90	16.90
Gray forge, Pittsburgh.....	17.15	17.40	17.40	15.15
Lake Superior charcoal, Chicago.....	19.50	19.50	19.50	19.50

BILLETS, &c. , Per Gross Ton:				
Bessemer billets, Pittsburgh.....	27.50	27.50	27.50	25.00
Forging billets, Pittsburgh.....	31.00	31.00	31.00	27.00
Open hearth billets, Philadelphia.....	30.60	30.60	30.60	26.20
Wire rods, Pittsburgh.....	33.00	33.00	33.00	33.00
Steel rails, heavy, at mill.....	28.00	28.00	28.00	28.00

OLD MATERIAL , Per Gross Ton:				
Steel rails, melting, Chicago.....	17.00	17.00	17.25	14.50
Steel rails, melting, Philadelphia.....	17.00	17.00	17.00	15.75
Iron rails, Chicago.....	26.00	20.00	20.00	18.25
Iron rails, Philadelphia.....	20.50	20.50	20.50	19.50
Car wheels, Chicago.....	18.00	18.00	18.50	15.25
Car wheels, Philadelphia.....	17.00	17.50	17.50	15.50
Heavy steel scrap, Pittsburgh.....	17.50	17.50	18.00	16.00
Heavy steel scrap, Chicago.....	16.00	16.00	16.00	13.75
Heavy steel scrap, Philadelphia.....	17.00	17.00	17.00	15.75

FINISHED IRON AND STEEL , Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia.....	1.65	1.60	1.65	1.50
Common iron bars, Chicago.....	1.60	1.60	1.60	1.50
Common iron bars, Pittsburgh.....	1.70	1.70	1.70	1.50
Steel bars, tidewater, New York.....	1.66	1.66	1.66	1.56
Steel bars, Pittsburgh.....	1.50	1.50	1.50	1.40
Tank plates, tidewater, New York.....	1.71	1.71	1.71	1.76
Tank plates, Pittsburgh.....	1.55	1.55	1.55	1.60
Beams, tidewater, New York.....	1.71	1.71	1.71	1.76
Beams, Pittsburgh.....	1.55	1.55	1.55	1.60
Angles, tidewater, New York.....	1.71	1.71	1.71	1.76
Angles, Pittsburgh.....	1.55	1.55	1.55	1.60
Skelp, grooved steel, Pittsburgh.....	1.50	1.50	1.50	1.45
Skelp, sheared steel, Pittsburgh.....	1.60	1.60	1.60	1.50

SHEETS, NAILS AND WIRE , Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh.....	2.40	2.40	2.40	2.50
Wire nails, Pittsburgh.....	1.85	1.85	1.85	1.95
Cut nails, Pittsburgh.....	1.80	1.85	1.85	1.75
Barb wire, galv., Pittsburgh.....	2.15	2.15	2.15	2.40

METALS , Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York.....	13.87½	13.87½	14.00	13.50
Electrolytic copper, New York.....	13.62½	13.62½	13.75	13.37½
Spelter, New York.....	6.12½	6.25	6.30	5.10
Spelter, St. Louis.....	5.90	6.00	6.15	4.90
Lead, New York.....	4.70	4.70	4.70	4.15
Lead, St. Louis.....	4.60	4.60	4.65	4.00
Tin, New York.....	32.60	32.45	33.40	27.90
Antimony, Hallett, New York.....	8.25	8.25	8.25	8.00
Nickel, New York.....	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York.....	\$3.84	\$3.84	\$3.84	\$3.89

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel F.O.B. Pittsburgh.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.55c., net; I-beams over 15 in., 1.65c., net; H-beams over 8 in., 1.75c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.60c., net; angles over 6 in., 1.65c., net; angles, 3 x 3 in. and up, less than ¼ in., 1.75c., base, half extras, steel bar card; tees, 3 in. and up, 1.65c., net; zees, 3 in. and up, 1.60c., net; angles, channels and tees, under 3 in., 1.50c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.80c., net; hand rail tees, 2.80c., net; checkered and corrugated plates, 2.80c., net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.55. to 1.60c., base. Following are extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February

6, 1903, or equivalent, 1/4-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered 1/4-in. plates. Plates over 72 in. wide must be ordered 1/4-in. thick on edge, or not less than 11 lb. per square foot; to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under 1/4-in. to and including 3-16-in. on thinnest edge.....	\$0.10
Gauges under 3-16-in. to and including No. 8.....	.15
Gauges under No. 8 to and including No. 9.....	.25
Gauges under No. 9 to and including No. 10.....	.30
Gauges under No. 10 to and including No. 12.....	.40
Sketches (including all straight taper plates), 3 ft. and over in length.....	.10
Complete circles, 3 ft. diameter and over.....	.20
Boiler and flange steel.....	.10
"A. B. M. A." and ordinary firebox steel.....	.20
Still bottom steel.....	.30
Marine Steel.....	.40
Locomotive firebox steel.....	.50
Widths over 100 in. up to 110 in., inclusive.....	.05
Widths over 110 in. up to 115 in., inclusive.....	.10
Widths over 115 in. up to 120 in., inclusive.....	.15
Widths over 120 in. up to 125 in., inclusive.....	.25
Widths over 125 in. up to 130 in., inclusive.....	.50
Widths over 130 in.....	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive.....	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive.....	.50
Cutting to lengths or diameters under 1 ft.....	1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

TERMS.—Net cash 30 days.

Sheets.—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 to 21, 2.20c.; Nos. 22 to 24, 2.25c.; Nos. 25 and 26, 2.30c.; No. 27, 2.35c.; No. 28, 2.40c.; No. 29, 2.45c.; No. 30, 2.55c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.60c.; Nos. 17 to 21, 2.75c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3.10c.; No. 27, 3.30c.; No. 28, 3.50c.; No. 29, 3.60c.; No. 30, 3.85c. Painted roofing sheets, No. 28, \$1.70 per square. Galvanized roofing sheets, No. 28, \$3 per square, for 2 1/2-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe which went into effect January 1:

	Steel—Black, Galv.	Iron—Black, Galv.
1/4 and 1/2 in.....	70	65
3/4 in.....	71	66
1 in.....	74	69
1 1/4 to 6 in.....	78	73
7 to 12 in.....	72	67
Plugged and Reamed.		
1 to 4 in.....	76	71
Extra Strong, Plain Ends.		
1/4 to 3/4 in.....	63	58
3/4 to 4 in.....	70	65
4 1/2 to 8 in.....	66	61
9, 10, 11 and 12 in.....	54	42
Double Extra Strong, Plain Ends.		
1/4 to 8 in.....	59	54
The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.		

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1 1/4 in.....	49	43
1 1/4 to 2 1/4 in.....	61	43
2 1/4 in.....	63	48
2 1/4 to 5 in.....	69	55
6 to 13 in.....	60	43
2 1/4 in. and smaller, over 18 ft., 10 per cent. net extra.		
2 1/4 in. and larger, over 22 ft., 10 per cent. net extra.		

Less than carloads to destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, \$33.

Steel Rivets.—Structural rivets, 2.15c., base; boiler rivets, 2.25c., base, subject to usual extras.

Pittsburgh.

PARK BUILDING, February 2, 1910.—(By Telegraph.)

Pig Iron.—Aside from the straight sale of basic pig iron involving 24,000 tons, made by a dealer to a local consumer, and fully noted in our report last week, no recent sales of magnitude have taken place and the market continues quiet. None of the large steel companies is in the market for either Bessemer or basic iron, but it is possible that some buying may be done by these interests this month, and if this takes place it will benefit the market considerably. A good deal of both Bessemer and basic iron is held by dealers who continue to offer it at lower prices than are quoted by the furnaces. Bessemer iron remains nominally at \$19, at Valley furnace, but has been offered recently by dealers as low as \$18.50, at furnace. We quote Bessemer iron

nominally at \$19 in the absence of sales; basic, \$16.50; malleable Bessemer, \$17; No. 2 foundry, \$17, and gray forge, \$16.25, all at Valley furnace, the freight rate to Pittsburgh being 90c. a ton.

Steel.—There are numerous inquiries in the market for medium sized lots of standard billets, also small open hearth and forging billets for prompt delivery, showing clearly that the mills are still behind in shipments, and not delivering steel as promptly as consumers need it. We quote Bessemer billets at \$27.50 to \$28; open hearth billets, \$28.50 to \$29; sheet bars, \$29; forging billets, \$31 to \$32, all at maker's mill, plus actual freight to point of delivery.

(By Mail.)

Some explanation of the weakness in the price of basic pig iron is found in the fact that, according to reliable reports, 60,000 to 70,000 tons of basic for early delivery are held by dealers, and a part of this is pressing the market to find buyers. Most furnacemen continue to quote \$17, at Valley furnace, for basic, but it has been offered in a number of cases at \$16.50 or lower for prompt shipment. None of the large steel companies has recently been in the market as buyers and no large inquiries are out. The Jones & Laughlin Steel Company was a large buyer of Bessemer and basic iron in the last half of last year, but this company is now running one furnace at Aliquippa, making nearly 500 tons a day, and will have another ready in two or three weeks, so that it will probably not need any more outside iron. Republic and Cambria have a good deal of iron due them on old contracts, and so has the Youngstown Sheet & Tube Company. This iron is being taken out promptly, but there is a lack of new buying, and the whole pig iron market is heavy. Furnaces still quote \$19, at furnace, for Bessemer iron, but dealers are offering it in small lots as low as \$18.50, at furnace. There has been a quieting down in finished lines, explained by the heavy specifications in November and December, and the unfavorable attitude at Washington against the railroads and large interests has caused a postponement of pending orders for rails, cars, locomotives and other equipment. If the present quiet condition is only a lull, and it is so regarded by many in the trade, it is a good thing, as the pace last fall was pretty swift, and the market needed a check to prevent it from running away. Underlying conditions are good, but we are going through a period of hesitation in the placing of new business that is being severely felt. The finishing mills are pretty comfortably filled for two or three months ahead, and on some lines, such as sheets and tin plate, up to July 1; but specifications in January were much below the preceding two months, and should February and March not show betterment order books will commence to thin out. The severe weather in December and January put almost a complete stop to building operations, and a check in new demand for materials entering into construction has resulted. The situation is causing some uneasiness, and there is a disposition to go slow until the attitude of Washington is more clearly defined. While the steel car companies are not getting much new business, they are pretty well filled for the next 60 or 90 days. Steel billets and all lines of finished material are firm in price and mills are still far back in deliveries, notably on plates, bars, sheets, and, to some extent, on structural shapes. The coke market is quiet and prices on prompt coke are lower. Scrap is also dull, but with prices fairly steady.

Ferromanganese.—No sales of moment have been made in the past week, and there is not much inquiry. We quote 80 per cent. foreign for delivery over this quarter at \$44, seaboard, and about \$45 for delivery in second and third quarters.

Ferrosilicon.—There is not much new demand, consumers being pretty well covered, but the market is fairly strong. We quote 10 per cent. at \$23.90; 11 per cent., \$24.90; 12 per cent., \$25.90, and 50 per cent., \$62 to \$62.50, Pittsburgh, for prompt shipment.

Muck Bar.—Prices on forge iron have gone off slightly and muck bar is showing a weaker tone. We continue to quote best grades, in the absence of any recent sales, at \$30, Pittsburgh, but on a firm offer this price might be shaded.

Rods.—Local consumers of rods, such as James McKay & Co., Garland Nut & Rivet Company, Standard Horse Nail Company and others, are pretty well covered on their requirements of rods up to July 1, and there is not much local inquiry. Prices are firm, however, and we continue to quote Bessemer, open hearth and chain rods at \$33 to \$34, f.o.b. Pittsburgh.

Skelp.—There is not much new inquiry, but the mills are pretty well filled up, buyers specifying quite freely on their contracts for skelp placed some time ago. Prices are firm, and we quote grooved steel skelp at 1.50c. to 1.55c.; sheared steel skelp, 1.60c. to 1.65c.; grooved iron skelp, 1.75c. to 1.80c., and sheared iron skelp, 1.90c., all for ordinary width and gauges, f.o.b. Pittsburgh.

Steel Rails.—Reports are current that the Baltimore & Ohio Railroad has placed 35,000 to 40,000 tons, part of which came to the local mills, but this is not confirmed. Some foreign inquiries aggregating 40,000 to 50,000 tons are in the market, but domestic mills have not much hope of getting any of this business. New orders for light rails are fairly active, the Carnegie Company having taken about 3000 tons last week. We quote steel axles at 1.75c. to 1.80c. and splice bars, 1.50c., at mill, Pittsburgh. Light rail prices are as follows: 8 to 10 lb., \$32; 12 to 14 lb., \$29; 16, 20 and 25 lb., \$28; 30 and 35 lb., \$27.75, and 40 and 45 lb., \$27, Pittsburgh. These prices are for 250-ton lots and over, and for small lots premiums of 50c. per ton and more are being paid. We quote standard sections at \$28, at mill.

Plates.—Some further orders for steel cars have been placed, but the amount of such business is disappointing to the car builders, who expected that the railroads would be buying more freely by this time. The unfavorable attitude of Washington toward railroads is said to have been the cause of a number of purchasing agents of railroads receiving direct orders from their superior officers not to place any contracts for materials other than what may be actually needed. The Union Fruit Company, New York, has placed 75 flat cars with the Middletown Car Company and the Virginian Railway has placed an order with the Pressed Steel Car Company for 1000 gondolas, the plates and shapes for which will be rolled by the Carnegie Steel Company. The Southern Railway is reported to be in the market for 2600 car bodies. The demand for plates has quieted down, but specifications are coming in freely on contracts which will give the mills full work for two or three months. The market is firm, and we quote $\frac{1}{4}$ -in. and heavier plates at 1.55c. in large lots and 1.60c. to 1.65c. in small lots for prompt shipment.

Structural Material.—No increase in activity is noted in the local situation, the amount of new work coming out being smaller than for some time. The Riter-Conley Mfg. Company has taken 1200 tons for an extension to the open hearth plant of the Midvale Steel Company at Nicetown, Pa., and the Jones & Laughlin Steel Company has taken 500 tons for a new house for George Gould at Port Washington, Long Island, and 500 tons for a public school in Philadelphia. The mills are making better deliveries on shapes, but on small sections are as far behind as ever. We quote beams and channels up to 15-in. at 1.55c., at mill, while small lots for spot shipment bring 1.60c. to 1.65c., at mill.

Tin Plate.—Heavy specifications are coming in from the salmon packers and other consumers, and the leading tin plate mills are operating to full capacity on these orders. Not much new business is being placed, but it is probable that the mills have more contracts on their books at this time than ever before and will run full up to July 1 or longer. The Standard Tin Plate Company, Canonsburg, Pa., will furnish about 100,000 boxes of tin plate per year to the Continental Can Company, which is building a can factory adjacent to its works, but will still have about 650,000 boxes per year for its regular trade. The market is very firm. We continue to quote 100-lb. cokes at \$3.60 per base box, f.o.b. Pittsburgh, for delivery up to July 1.

Sheets.—We note that premiums of \$2 a ton or more are being paid by consumers to mills that are in position to make prompt deliveries of electrical and blue annealed sheets. The American Sheet & Tin Plate Company is practically sold up to July 1 on all the sheets it can make, and this is also true of some of the independent mills. Regular prices are as follows: Blue annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c., and Nos. 14 and 15, 1.95c.; one-pass box annealed No. 28 black sheets, 2.40c., and No. 28 galvanized, 3.50c., at mill. We quote corrugated roofing sheets at \$1.70 per square for painted and \$3 for galvanized, $2\frac{1}{2}$ -in. corrugations. Jobbers charge the usual advances over these prices for small lots from store.

Bars.—The new demand for both iron and steel bars shows some falling off, but specifications against contracts are apparently as heavy as ever, and all the leading mills are still much behind in shipments. Mills that are in position to make prompt shipments of steel bars are still able to obtain \$2 to \$3 a ton over prices at which business is being taken for forward delivery. On contracts for delivery through first and second quarters several of the leading steel bar mills are naming 1.45c., at mill, but for prompt shipment 1.50c. to 1.55c. is being quoted. Iron bars are held at about 1.70c., Pittsburgh.

Hoops and Bands.—There is a fair run of small orders, but the mills are running mostly on specifications against contracts which continue to come in quite freely. We quote steel hoops for forward delivery at 1.50c. to 1.60c., and for prompt shipment at 1.60c. to 1.65c., at mill. Steel bands are 1.45c. to 1.50c., on contracts, and from 1.60c. to 1.65c. for prompt shipment.

Spelter.—There was a decided break in prices of spelter and last week it was reported that some was sold on the basis of about 6c., Pittsburgh. This was a special price, however, due to some unusual conditions, and the market

may be fairly quoted at 6c., East St. Louis, for prime grades, equal to 6.12 $\frac{1}{2}$ c., Pittsburgh.

Spikes.—Little new buying in spikes is being done by the railroads, only occasional small orders being placed, mostly for track repair work. Makers of spikes still have a good run of orders on their books and are pretty well filled up to April 1 or longer. We quote standard sizes of railroad spikes, $4\frac{1}{2}$ x 9-16 in. and larger, at \$1.75 to \$1.80 for first quarter. Boat spikes are firm, at \$1.80, base, and small railroad spikes at \$1.80, base. These prices are for carload and larger lots, 10c. per keg advance being charged for small lots.

Shafting.—Specifications against contracts continue to come in freely, and on a recent order for 500 tons practically the entire amount was specified for within two weeks after placing the order. Discounts on shafting remain on the basis of 55 per cent. off in carloads and 50 per cent. in less than carloads, delivered in base territory.

Rivets.—The new demand for rivets is fair, but the makers are running mostly on specifications against old orders placed some time ago, and which are coming in well. Prices are firm, but unchanged, and we quote: Structural rivets, $\frac{3}{4}$ -in. and larger, 2.15c., base; cone head boiler rivets, $\frac{3}{4}$ -in. and larger, 2.25c., base; $\frac{1}{2}$ -in. and 11-16-in. take an advance of 15c., and $\frac{1}{2}$ -in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill. The above prices are absolutely minimum on contracts for large lots, makers charging the usual advances of \$2 to \$3 a ton to the small trade.

Wire Products.—This is the dull season of the year in the wire trade, just before the opening up of spring business, and as a natural result the new demand is quiet, but specifications on contracts placed some time ago when prices were slightly lower than they are now continue to come in at a fairly satisfactory rate, but show a falling off as compared with the two closing months of last year. The market is firm, and it is stated that regular prices are being maintained. We quote wire nails at \$1.85 in carload and larger lots; painted barb wire, \$1.85; galvanized, \$2.15; annealed fence wire, \$1.65; galvanized, \$1.95, and cut nails, \$1.80, all f.o.b. cars, Pittsburgh, usual terms, with full freight to destination added.

Merchant Pipe.—Nothing definite has yet been done with the inquiry of the Arkansas Natural Gas Company for about 200 miles of large sizes of line pipe, but it is fully expected that this business will be placed within the next few months. It is stated that the Uncle Sam Oil Company will lay a 6-in. pipe line from Tulsa, Okla., to Houston, Texas, providing rights of way can be secured. The general demand for pipe is fairly active, but specifications on contracts in January showed a falling off as compared with the previous two months. Discounts, as printed on another page in this issue, are reported as being maintained.

Boiler Tubes.—New inquiry for tubes from the railroads is disappointing and some pending business is reported to have been withheld on account of expected unfriendly legislation. In fact, it is said that a number of leading railroads that were planning to place heavy orders for locomotives and other equipment that would have required a large tonnage of tubes have retired from the market until the situation has cleared up. The demand for merchant tubes is fairly active, and it is stated that the discounts printed on another page in this issue are being maintained.

Iron and Steel Scrap.—There is not much new demand for scrap, consumers being pretty well filled up, some of them reported as staying out of the market in the belief that prices would be lower. The tone of the scrap market is soft, and it is not improbable that on a firm offer our prices might be slightly shaded, but at the same time it is true that there is not a heavy tonnage of scrap pressing the market to find sale. We repeat prices of last week, as follows: Heavy steel scrap for delivery at Monessen, Steubenville, Sharon, Follansbee and Pittsburgh, \$17.50. On other grades dealers quote about as follows: No. 1 cast scrap, \$16.50; No. 2, \$15.50; bundled sheet scrap, \$15.75 to \$16; rerolling rails, \$18.25 to \$18.50, for delivery at Cumberland, Md., Newark and Columbus, Ohio; railroad malleable scrap, \$15.75 to \$16; grate bars, \$12.75 to \$13; No. 1 busheling, \$15.25; No. 2, \$11.75; low phosphorus melting stock, \$21; iron axles, \$25.50 to \$25.75; steel axles, \$21.25 to \$21.50; locomotive axles, \$27.75 to \$28; old car wheels, \$17.75 to \$18; No. 1 railroad wrought scrap, \$18.50 to \$18.75; cast iron borings, \$10.25 to \$10.50; sheet bar crop ends, \$18.50 to \$18.75, and machine shop turnings, \$12.25 to \$12.50, all per gross ton, f.o.b. Pittsburgh.

Coke.—The new demand for both furnace and foundry coke has quieted down very much, and prices are soft and somewhat lower. Standard makes of furnace coke for prompt shipment have been offered in some cases as low as \$2.40 per net ton at oven, but the usual prices quoted are \$2.50 to \$2.60 at oven. The output of coke continues enormously heavy, the Upper and Lower Connellsville regions having made 471,222 net tons last week, an increase over the previous week of about 4000 tons.

Chicago.

FISHER BUILDING, February 2, 1910.—(By Telegraph.)

The struggle for materials to complete goods for the spring trade presents a spectacle in striking contrast with the conditions which prevailed a year ago. Then the steel men were begging for something more than hand to mouth orders to keep their mills going and business was generally taken at prices which showed a loss in an effort to awaken trade. To-day the sales offices and mills are in the storm center of a demand for more and more material for various industries which are controlled by the seasons and must have their goods ready for the spring trade. The automobile manufacturers have resident ambassadors or agents at the plants from which they obtain their parts and supplies in the hope of facilitating shipment by personal influence and supervision, and at the other end of the line the implement manufacturers are equally strenuous in calling for odd sections and special shapes on which deliveries have been delayed. Jobbers who carry general stocks of rolled steel products are receiving an unusual volume of orders from manufacturers who seldom buy from store but are willing at this time to pay almost any price for odds and ends of material which they cannot obtain from the mills. The trouble is not a shortage of crude steel, but rather a shortage of all the little things and special materials on which the trade has run so far ahead of former years that the mills or the plants making these special materials are overtaxed. The demand for light structural material and small lots is strong, but there is delay in closing contracts for large projects, as the buyers in many cases are not yet reconciled to 1910 prices. Considerable new business in bars is going to Eastern mills which can make deliveries in 60 days, and some orders have been placed for delivery next fall. The wire mills had a lighter month in January on new sales, giving them an opportunity to catch up on delayed deliveries, but new business is coming forward rapidly in this line. In other directions, however, trade is quiet and in some respects disappointing. The railroads are keeping up their track, but are very slow in buying equipment, and new car and locomotive orders which were expected from Western roads are not coming out. The explanation offered is the old story of waiting for the outcome of legislation at Washington. In old material most lines are quiet, but there is an active inquiry for cast scrap as well as for heavy wrought scrap and car axles. Relaying rails for lumbering and mining roads are in active demand.

Pig Iron.—The malleable foundries have had the iron market practically to themselves the past week. A few lots of Southern foundry have been sold and other inquiries are pending for foundry grades, but the only business of moment is in malleable Bessemer. Nearly all the malleable foundries in this district and the West have been in the market the past month. Many furnace interests have been reluctant to take business for last half delivery, but the foundries have been willing to buy, and the southern Ohio furnaces have encouraged the movement and have taken considerable business, although all the furnaces which sell malleable Bessemer in this territory have taken more or less of it. It is estimated that sales of malleable Bessemer in Chicago territory during the month have amounted to 50,000 tons, with good inquiries still pending or only partially covered. One Chicago foundry has bought something over 8000 tons for last half, and a Moline interest is believed to have taken almost as much. One inquiry is reported from Milwaukee for 5000 tons and another from Racine for the same amount, with various inquiries and sales from other points of 500 to 2000 tons each. Good inquiries are also reported from St. Louis, one being for 10,000 and one for 5000 tons. A good deal of the business done is for second and third quarters. Prices have remained fairly steady throughout this movement, and efforts to obtain higher figures for last half iron, while successful in a few instances, have not been maintained, although it is generally recognized that the cost of making iron will be considerably higher in the last half. Some of the furnace interests are disappointed because this buying movement has not developed a higher level of prices for the last half. Lake Superior charcoal is firm, but stocks are accumulating, as the car foundries are buying nothing and report their business very dull. The trouble feared from the demand of union molders in Chicago for higher wages has blown over, as the foundries working under union contract have conceded an advance. The following quotations are for February and March delivery, f.o.b. Chicago:

Lake Superior charcoal.....	\$19.50 to \$20.00
Northern coke foundry, No. 1.....	19.50 to 20.00
Northern coke foundry, No. 2.....	19.00 to 19.50
Northern coke foundry, No. 3.....	18.50 to 19.00
Northern Scotch, No. 1.....	19.00 to 19.50
Southern coke, No. 1.....	18.85 to 19.35
Southern coke, No. 2.....	18.35 to 18.85
Southern coke, No. 3.....	17.85 to 18.35
Southern coke, No. 4.....	17.60 to 18.10
Southern coke, No. 1 soft.....	18.85 to 19.35
Southern coke, No. 2 soft.....	18.35 to 18.85
Southern gray forge.....	17.35 to 17.85
Southern mottled.....	17.10 to 17.60

Malleable Bessemer.....	19.00 to 19.50
Standard Bessemer.....	21.40 to 21.90
Jackson Co. and Kentucky silvery, 6%.....	21.40 to 21.90
Jackson Co. and Kentucky silvery, 8%.....	22.40 to 22.90
Jackson Co. and Kentucky silvery, 10%.....	23.40 to 23.90

(By Mail.)

Billets.—The lack of any regular supply of billets in this market makes it impossible to quote a market price. A few large consumers of axle billets are taken care of, but the smaller consumers of forging billets are dependent upon occasional offerings from Eastern mills, prices being governed entirely by conditions at the time. Consumers who can utilize the odd lots that are offered find the price fairly steady, but those who buy on special analysis have to pay a stiff premium.

Rails and Track Supplies.—Orders taken last week by the Illinois Steel Company for standard rails amounted to about 17,000 tons, while light rails maintain their usual average. New business and specifications for track supplies continue in excess of the capacity of the local mills, which apparently have no prospect of keeping up with the demand or making any gain on their accumulation of business until the smaller merchant mills at Gary are completed and utilized for some of this business. We quote standard railroad spikes at 1.85c. to 1.95c., base; track bolts and square nuts, 2.40c. to 2.60c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., \$27; 30 to 35 lb., \$27.75; 16, 20 and 25 lb., \$28; 12 lb. \$29, Chicago.

Structural Material.—New contracts for fabricated material were light last week. The Pennsylvania Steel Company booked 950 tons of bridges for the Idaho, Washington & Northern Railway Company, and the American Bridge Company took 238 tons of girder bridges for elevated crossings at Spokane, Wash., of the Spokane & Inland Empire Railway Company. According to reports here, no important business was closed in other Western territory. There is, however, a very large amount of current business in small lots, mostly going into building construction. This has been a feature of the market for the past six months, and has not been affected by the readjustment to the 1910 prices, which is undoubtedly accountable for the check in contracting the past month on large projects. It is understood here that fabricating business for January throughout the entire country, including buildings as well as railroad and other bridges, amounted to about 100,000 tons. In view of the fact that the closing of many large contracts has been delayed by the effort of the purchasers to get concessions in prices, the business actually booked is fairly satisfactory. The fabricators of the United States can probably do 150,000 tons of business per month, but they already have several months' business on the books, having in hand about all the mills supplying them can take care of, especially in the West. We quote plain material from mill, 1.78c. to 1.88c., Chicago; from store, 2c., Chicago.

Plates.—The local mills are sold so far ahead that very attractive business has been declined recently because it was out of the question to give the deliveries that were desired. The Eastern mills represented here are still open for business, and a good deal of disappointment is expressed because the Western railroads are not coming forward with new car business. Instead of increasing their equipment to take care of the growth of the country, Western roads have less cars than two years ago. Builders of wooden cars have very little business ahead of them, and the steel cars under construction will not replace the equipment going into scrap. Even passenger equipment is running down on roads which used to be noted for good management. The plate market, however, continues firm, as the Eastern mills which are taking the new business have no difficulty in getting the full market price. Prices are necessarily very firm. We quote mill prices at 1.78c. to 1.88c., Chicago; store prices, 2c., Chicago.

Sheets.—Conditions in the sheet market continue about the same in Chicago, with the demand for blue annealed sheets far ahead of the capacity of the mills. New business is coming forward steadily from the jobbing and general trade for galvanized and black sheets. We quote, subject to a premium on blue annealed sheets, as follows, Chicago: No. 10 blue annealed, 1.93c.; No. 28 black, 2.58c.; No. 28 galvanized, 3.68c. Prices from store, Chicago, are: No. 10 blue annealed, 2.25c. to 2.35c.; No. 28 black, 2.90c. to 3c.; No. 28 galvanized, 4c. to 4.10c.

Bars.—Jobbers who carry large stocks of rolled iron and steel are beginning to place orders for delivery next fall, especially on odd sections like concave sleigh shoe steel, which must be on hand at the time the trade demands it. There has been a good profit this winter in selling from store bars and other material bought last year at low prices, as many industrial consumers have had to buy from store in carload lots when they ran short of steel expected from the mills. The bar iron mills are getting a premium right along on carload lots purchased by implement manufacturers, wherever these mills are equipped to roll steel bars from billets or old axles. Some of the Eastern mills are

able to promise deliveries of soft steel bars in 60 days, but the Western mills are three to five months behind on their specifications. Deliveries are better on hard steel bars, and on bar iron the mills can make shipments within a few weeks. Subject to the usual delay in delivery on soft steel bars, we quote as follows: Soft steel bars, 1.68c. to 1.78c.; bar iron, 1.60c. to 1.65c.; hard steel bars rolled from old rails, 1.60c. to 1.65c., all Chicago.

Rods and Wire.—The mills are not delayed so much by embargoes on their material in transit, and the railroads are also doing better in furnishing cars, but conditions are still far from satisfactory. New business and specifications continue very good. The farmers through the West are feeling cheerful as the abundance of snow puts their land in good condition for spring, and they are getting high prices for all their products. As a result the jobbing demand is heavy and buying is stimulated in practically every branch of the business, especially in view of the prospect of higher prices in the near future. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.83c.; wire nails, 2.03c.; painted barb wire, 2.03c.; galvanized, 2.33c., all Chicago.

Merchant Steel.—Buyers of agricultural steel are apparently becoming reconciled to the fact that they will not be able to get as much as they wanted for their spring trade. There is a good demand for machinery and crucible steel and sales from store are unusually heavy owing to the longer time required to obtain shipments from mill.

Cast Iron Pipe.—There is a fair volume of inquiry and quite a little business is coming in for small lots, but no large lettings of any moment have been reported for the past week. The city of Chicago is in the market for 5700 tons of water pipe, but the specifications are not very desirable, as the city officials want the right to stop with half the tonnage asked for in the bids, as well as the right to take 50 per cent. more, making the contract run from 3000 to 9000 tons at the option of the purchaser during a time extending over more than a year. It is difficult to harmonize business of this kind with the conditions that prevail in the pig iron market. Next week the city of Detroit will open bids for 3800 tons of water pipe, and it is expected that municipal lettings will become active in the near future. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., \$28.50; 6 to 12 in., \$27.50; 16-in. and up, \$26.50, with \$1 extra for gas pipe.

Metals.—The spelter manufacturers have been unable to hold prices the past week, and quotations show a marked decline and are nominal. Purchasers of round lots have been able to do 5.80c. and 5.85c., Chicago, these of course being inside prices which are not available to the ordinary carload buyer. Jobbers are quoting in Chicago 6c. to 6.10c., a decline of 0.15c. from the prices quoted last week. Copper is quiet, with the demand in the jobbing trade rather light. Tin is still erratic, with the general level about the same as a week ago. We quote as follows: Casting copper, 13 $\frac{3}{4}$ c.; lake, 14 $\frac{1}{2}$ c., in carloads, for prompt shipment; small lots, $\frac{1}{4}$ c. to $\frac{3}{4}$ c. higher; pig tin, car lots, 33 $\frac{3}{4}$ c.; small lots, 35c.; lead, desilverized, 4.70c. to 4.80c., for 50-ton lots; corroding, 4.95c. to 5.05c., for 50-ton lots; in carloads, 2 $\frac{1}{2}$ c. per 100 lb. higher; spelter, 6c. to 6.10c.; Cookson's antimony, 10 $\frac{3}{4}$ c., and other grades, 9 $\frac{3}{4}$ c. to 10 $\frac{1}{4}$ c.; sheet zinc is \$7.75, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote: Copper wire, crucible shapes, 13 $\frac{3}{4}$ c.; copper bottoms, 12c.; copper clips, 13 $\frac{3}{4}$ c.; red brass, 12 $\frac{1}{4}$ c.; yellow brass, 10c.; light brass, 7c.; lead pipe, 4 $\frac{1}{2}$ c.; zinc, 5.25c.; pewter, No. 1, 23c.; tin foil, 26c.; block tin pipe, 28c.

Old Material.—The market continues quiet and some grades of spot scrap are a little easier, as there is more material coming in from the country than under the snow-bound conditions which prevailed a few weeks ago. Heavy wrought scrap, however, continues in good demand. Old car axles are scarce, and dealers in many cases are able to get a fat profit where they have the axles for a prospective buyer. Iron angle bars, arch bars and transoms and other choice wrought scrap are also in demand. Foundry buyers of scrap have found very little available for immediate delivery, and have had to pay higher prices, one or two lots going as high as \$15.75. Relaying rails are in good demand. The Chicago, Burlington & Quincy received higher prices last week on rerolling rails than on the list offered the week before as well as for frogs, switches and guards, the bids received by this company on all grades checking closely within the prices quoted below. Opinion is divided among dealers as to the probable course of the market when winter breaks up and the spring movement of scrap begins. The following prices are per gross ton, delivered, Chicago:

Old iron rails.....	\$20.00 to \$20.50
Old steel rails, rerolling.....	18.00 to 18.50
Old steel rails, less than 3 ft.....	17.00 to 17.50
Relaying rails, standard sections, subject to inspection.....	24.00 to 25.00
Old car wheels.....	18.00 to 18.50
Heavy melting steel scrap.....	16.00 to 16.50
Frogs, switches and guards, cut apart..	16.00 to 16.50
Shoveling steel.....	15.50 to 16.00

The following quotations are per net ton:

Iron angles and splice bars.....	\$17.50 to \$18.00
Iron car axles.....	21.50 to 22.00
Steel car axles.....	21.00 to 22.00
No. 1 railroad wrought.....	15.00 to 15.50
No. 2 railroad wrought.....	14.00 to 14.50
Springs, knuckles and couplers.....	14.75 to 15.25
Locomotive tires, smooth.....	19.00 to 19.50
No. 1 dealers' forge.....	12.50 to 13.00
Steel axle turnings.....	11.50 to 12.00
Machine shop turnings.....	10.50 to 11.00
Cast and mixed borings.....	7.50 to 8.00
No. 1 busheling.....	12.75 to 13.25
No. 2 busheling.....	9.75 to 10.25
No. 1 boilers, cut to sheets and rings..	11.50 to 12.00
No. 1 cast scrap.....	15.25 to 15.75
Stove plate and light cast scrap.....	12.50 to 13.00
Railroad malleable.....	15.00 to 15.50
Agricultural malleable.....	13.00 to 13.50
Pipes and flues.....	11.75 to 12.25

Philadelphia.

PHILADELPHIA, PA., February 1, 1910.

The market for both crude and finished materials is easier. In several grades of pig iron prices have declined and while quotations on finished materials are comparatively firm, deliveries on some classes of rolled products have improved considerably. Unfavorable weather conditions have held up outside work to a considerable extent, while probable legislative action, as well as an unfavorable security market, has also had a depressing effect on the market. Notwithstanding these conditions, consumers were, as a rule, willing to go ahead with purchases, but when a softening of pig iron prices developed a number of the prospective buyers withdrew from the market and will await further developments before making purchases. The general situation is in a somewhat unsettled state, and the looked for buying movement which was expected to develop at this time will, no doubt, be deferred until the market again gets its bearings. The old material market has been at a standstill. Coke is decidedly easier, lower prices prevailing for both prompt and forward shipments.

Pig Iron.—While there was a fairly good movement in foundry grades early in the week, the demand fell off sharply with the announcement late in the week of a cut in prices ranging from 25 to 50 cents a ton for deliveries over the first half of the year, the most decided reduction being in the Virginia grades. The leading Virginia producer, who had accumulated quite a stock of iron, made a reduction of 50 cents a ton, which was met by practically all of the other producers in that section, and No. 2 X Virginia foundry can now be freely had at \$18.50, delivered in this territory, during the first half, although for second half \$19, delivered, is still being maintained. Northern foundry grades have not broken as sharply as have the Virginia irons. A number of the producers in this district are pretty well sold up for the first half, and are, therefore, not in a position to take on any large additional orders, under which circumstances they maintain at present their recent quotation of \$19, delivered, for No. 2 X. Other sellers have, however, offered this grade at slightly lower figures, \$18.75, delivered, in instances being named, although reports are current that several blocks have been offered at even lower figures, but sellers will not admit it. Before the break in prices came, quite a few sales for second half delivery had been made by some sellers, fairly good sized lots having been taken at prices equal to \$19 for No. 2 X, delivered here. A fair volume of small lot business in both 2 X and No. 2 plain iron was also done at the same basis. A considerable movement in low grade iron is noted; an aggregate of some 5500 tons of off iron has been sold to the cast iron pipe foundries in this district, the greater part at a price concession. Some little business is still pending, although in view of conditions buyers are not so anxious to come into the market. Some little movement has occurred in charcoal pig iron. Offerings at lower figures have, however, checked the general foundry iron buying. A weakness in basic iron also developed during the week; a sale of 6000 tons for second quarter delivery was made to one Eastern mill at a confidential price, known, however, to be under the recent quotations, while a sale of 2000 tons to another consumer, for the same delivery, was made at \$18.50, delivered. These sellers contend, however, that they have no more iron to offer for the delivery and price named, and that their present quotation is \$18.75, delivered. Producers other than those referred to are, for the most part, sold up well into the third quarter and are now holding this grade at \$18.75, delivered. Some little inquiry is still before the trade, but we can learn of no further sales. There has been quite a good movement in low phosphorus iron; one sale of 6000 tons, understood to be for second half, and another of 1000 tons, for earlier delivery, are reported at prices equal to \$23, delivered in this district. An inquiry for 1500 tons is still on the market. Forge iron has not been active; moderate sales of this grade have been sold at \$17.50, one lot of 700 tons being reported at this figure, while small lots have been disposed of at 50 cents

above that price. For shipment during the balance of the first half of the year, the following range of prices is named for delivery in buyers' yards, eastern Pennsylvania and vicinity:

Eastern Pennsylvania, No. 2 X foundry.....	\$18.75 to \$19.00
Eastern Pennsylvania, No. 2 plain.....	18.25 to 18.50
Virginia, No. 2 X foundry.....	18.50
Virginia, No. 2 plain.....	18.00
Gray forge.....	17.50 to 18.00
Basic.....	18.50 to 18.75
Low phosphorus.....	23.00 to 23.25

Ferromanganese.—A wide range of quotations came out during the week on a lot of several hundred tons, sellers naming from \$43.50 to \$47, seaboard, under varying delivery conditions. The transaction was closed at \$43.50, seaboard, delivery extending over the balance of the year. No fresh demand has developed.

Billets.—The demand continues active. Eastern mills are well engaged and some producers have enough business ahead to enable them to select orders. Considerable inquiry still comes from Western consumers. Prices are well maintained, \$30, mill, being quoted for ordinary open hearth rolling billets. Forging billets command from \$33 to \$36, Eastern mill, according to specifications, with premiums asked for prompt shipment.

Plates.—Orders do not come out as freely, and deliveries are in some instances considerably easier, particularly on universal plates. Current business is largely made up of small orders covering a general range of material, and in some cases mills are not so fully engaged. Prices, however, continue to be well maintained, although there are unconfirmed rumors of concessions on desirable competitive business. For reasonably early shipment ordinary plates command from 1.75c. to 1.80c., delivered in this vicinity.

Structural Material.—Transactions have been largely of a miscellaneous character. Contracts for several small railroad stations, requiring several hundred tons of structural material, have been let, while several contracts for hotels, an apartment house and smaller buildings are being figured on by contractors. The outlook for spring business is considered favorable; meanwhile mills are catching up, to some extent, on delayed deliveries. Prices are unchanged, 1.75c. to 1.80c. being named for plain shapes, delivered in this vicinity.

Sheets.—Prompt deliveries are hard to obtain. Producers are booked ahead for several months and have practically all the business they can well take care of. From the nature of inquiries received the consumption appears to be steadily increasing. For reasonably early delivery the following range of prices is quoted: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3c.; No. 27, 3.10c.; No. 28, 3.20c.

Bars.—The demand continues quiet. Business transacted in refined iron bars has been mostly in small and moderate sized lots for comparatively early delivery. Delayed deliveries still hold business back in steel bars; and new business has been light. Prices show practically no change. Steel bars continue to be quoted at 1.65c. to 1.70c., but only distant shipment can be made on desirable sizes. Leading producers of refined iron bars maintain quotations ranging from 1.65c. to 1.70c., delivered in this territory, although some of the smaller producers are understood to be shading those figures on desirable orders.

Old Material.—While embargoes have been lifted at several steel mills, no fresh shipments of scrap are being taken, consumers claiming to be well supplied with old materials of practically all classes. The general situation shows little change, prices show a further decline on small transactions, and the market generally is in an unsatisfactory condition. The recent ruling of the Treasury Department, regarding the classification of scrap iron and steel under the \$1 duty, modifies former instructions and permits of a wider range of classification under that rate. The new ruling became effective January 28. The following range of quotations, while still largely nominal, is named for deliveries in buyers' yards, eastern Pennsylvania and nearby points:

No. 1 steel scrap and crops.....	\$17.00 to \$17.50
Old steel rails, rerolling.....	18.00 to 18.50
Low phosphorus.....	22.75 to 23.25
Old steel axles.....	23.00 to 24.00
Old iron axles.....	28.00 to 29.00
Old iron rails.....	20.50 to 21.50
Old car wheels.....	17.00 to 17.50
No. 1 railroad wrought.....	19.25 to 19.75
Wrought iron pipe.....	16.50 to 17.00
No. 1 forge fire.....	15.50 to 16.00
No. 2 light iron.....	10.25 to 10.75
Wrought turnings.....	14.00 to 14.50
Cast borings.....	12.00 to 12.50
Machinery cast.....	16.50 to 17.00
Railroad malleable.....	17.00 to 18.00
Grate bars.....	14.50 to 15.00
Stove plate.....	13.00 to 13.50

Coke.—Prices again show a decline. Most consumers refuse to contract for extended delivery, although there is one inquiry before the trade for a large block of furnace coke for first half. Buying has been largely for month to month needs, as a result of which there is a good supply of stock coke, to move which producers frequently shade quotations.

One lot of 2000 tons of prompt furnace coke has been sold at \$2.35 per net ton, at oven, while even lower figures have been named for a larger tonnage. Foundry coke is rather quiet, with \$2.85 to \$3.10, at oven, named for near future shipment, although less well-known brands are to be had at somewhat lower figures. The following range of prices is named per net ton, delivered in this vicinity:

Connellsville furnace coke.....	\$4.35 to \$4.60
Foundry coke.....	5.10 to 5.35
Mountain furnace coke.....	3.95 to 4.20
Foundry coke.....	4.70 to 4.95

Cincinnati.

CINCINNATI, OHIO, February 2, 1910.—(By Telegraph.)

Although this market is not particularly active in any line save finished material, there is an undertone to the pig iron situation that suggests a strong last half. Independent mills in central territory are all well engaged and the outlook is to them quite satisfactory. Scrap dealers are indifferent and some are not making any open quotations. There is some good buying of foundry coke.

Pig Iron.—There seems to be no difference of opinion as to the price on either Northern or Southern for the first half. While a few Southern furnaces are occasionally taking on a customer at \$14.25, Birmingham, for No. 2, standard brands of Alabama iron are obtainable for this delivery and through the third quarter at \$14. The statement is made that \$14 can be done through the entire year, but this is not confirmed. A leading Southern furnace interest has withdrawn from the market beyond July 1, and is quoting \$14.50 for second quarter. On the Northern product the price is \$17, Ironton, with a few sales reported of special brands on the basis of \$17.25 over the entire year. Sellers in both territories are watching developments at the Chicago headquarters of some Western railroads which are figuring on their malleable castings and expected to announce their needs soon. The south central Ohio malleable concern that wanted from 5000 to 10,000 tons has bought from 3000 to 5000 tons, divided among four Northern interests and at about \$17, Ironton, for deliveries during last half. The sewing machine manufacturer has bought, and it is reported from a nearby furnace. The car wheel concern in St. Louis territory has taken a good sized tonnage for second and third quarter. An inquiry for 1000 tons of foundry iron from northern Illinois for last half is expected to be closed this week. A sale of 600 tons of No. 2 Southern foundry, for delivery from March to September, inclusive, is reported at \$14.25, Birmingham. One of the largest selling agencies has refused an offer of \$17, Ironton, for last half from a large consumer in the Northwest. A manufacturing concern in the East is negotiating for 900 tons of Virginia iron, 300 tons per month, for April to June delivery. This iron is quoted at \$15.50 to \$16, at furnace. An inquiry from West Virginia is for 300 tons of Southern iron for second quarter, and the average run of inquiries for such delivery do not exceed this quantity. There has been a little accumulation of silvery in the South which is now being offered at about the same delivered price as the Jackson County product. For prompt delivery and for the remainder of first half, based on freight rates of \$3.25 from Birmingham and \$1.20 from the Hanging Rock District, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry.....	\$17.75
Southern coke, No. 2 foundry.....	17.25
Southern coke, No. 3 foundry.....	16.75
Southern coke, No. 4 foundry.....	16.00
Southern coke, No. 1 soft.....	17.75
Southern coke, No. 2 soft.....	17.25
Southern gray forge.....	16.00
Mottled.....	15.75
Ohio silvery, 8 per cent, silicon.....	21.20
Lake Superior coke, No. 1.....	18.70
Lake Superior coke, No. 2.....	18.20
Lake Superior coke, No. 3.....	17.70
Standard Southern car wheel.....	\$24.75 to 25.25
Lake Superior car wheel.....	21.75 to 22.25

(By Mail.)

Coke.—An improvement is noted in the car supply, with the single exception of the Pocahontas field, where car shortages still figure somewhat to the detriment of shippers. Furnaces are taking shipments quite promptly, and this particular end of the business shows an improvement over last week. Connellsville furnace grades are quotable at \$2.50 to \$2.65 per net ton at oven for prompt shipment, and on contract the range is \$2.65 to \$2.85. Connellsville foundry for prompt shipment is selling at \$3 to \$3.25, and on contract \$3.25 to \$3.35. Wise County foundry coke for prompt shipment is quoted at \$2.75 to \$3, and on contract \$3 to \$3.25. Wise County furnace grades prompt are quoted at \$2.50 to \$2.65, and any forward business is subject to special negotiation. Pocahontas shows no change in either grade. New River foundry \$2.75 to \$3 prompt and forward delivery.

Sheets.—The month closes satisfactorily to all inter-

ests in this territory. The Newport Rolling Mills Company reports every department fully engaged, which is rather unusual for this time of year, and the outlook very favorable. Second quarter business is being booked, but nothing is being taken for third quarter as yet. Rumors are heard of some cutting, but not from either the leading interest or larger independents, none of whom find any reason to make an aggressive move for business. The largest independent in this market reports the best January for several years. The prospect for higher raw material for last half consumption serves to indicate still higher prices for that delivery. For reasonably prompt delivery mills quote the Pittsburgh base price, plus 15c. freight from Pittsburgh. Mills are working up raw material stocks which are large on first and second quarter business, and not buying, which has a tendency to weaken scrap.

Finished Iron and Steel.—In finished products January closed strong, with specifications showing an increasing tendency. In steel bars the best that can be done is about 1.60c. on contract business, but for prompt delivery 1.65c. to 1.70c. is obtained by such mills as have available stocks. Implement makers continue to lead in specifying on contracts. Iron bars are stronger and the price is firm at 1.60c. to 1.65c., local mills. Structural material is easier, and some sections in stock can be shipped from mills in from 10 days to two weeks. About four weeks is required on other shapes.

Old Material.—Inactivity in scrap continues, and all prices are, if anything, a trifle weaker. Relayers are probably the most active, and the price is probably 50c. higher. There is no interest in car wheels. There is no movement in heavy melting steel, although dealers do not seem disposed to shade current prices much at this time. The largest dealers do not anticipate any business of consequence for three or four months. Quotations are as follows, f.o.b. Cincinnati:

No. 1 railroad wrought, net ton.....	\$14.50 to \$15.00
Cast borings, net ton.....	8.00 to 8.50
Heavy melting steel scrap, gross ton...	14.75 to 15.25
Steel turnings, net ton.....	9.50 to 10.00
No. 1 cast scrap, net ton.....	13.00 to 13.50
Burnt scrap, net ton.....	10.00 to 10.50
Old iron axes, net ton.....	18.50 to 19.00
Old iron rails, gross ton.....	18.00 to 18.50
Old steel rails, short, gross ton.....	15.00 to 15.50
Old steel rails, long, gross ton.....	16.00 to 16.50
Relaying rails, 56 lb. and up, gross ton.	23.00 to 24.00
Old car wheels, gross ton.....	15.00 to 15.50
Low phosphorus scrap, gross ton.....	17.50 to 18.00

The Domhoff-Joyce Company has acquired the Eastern representation of the Sloss-Sheffield Steel & Iron Company in territory west of the Alleghenies and western New York, including Buffalo, Pittsburgh and Cleveland, in addition to Western territory already controlled, and will immediately open an office in either Pittsburgh or Cleveland.

Matthew Addy & Co. have been appointed sole selling agents for the Ironton Iron Company, Ironton, Ohio, effective at once. This business was formerly divided up among several agencies.

J. Russell Houston of Portsmouth has accepted a position with Rogers, Brown & Co., at the general offices in Cincinnati, as auditor, effective at once. He has been manager for some time of the Black Fork Coal Company. Prior thereto he was superintendent of the Portsmouth Steel Company's plant.

Buffalo.

BUFFALO, N. Y., February 1, 1910.

Pig Iron.—The market in this district has been rather quiet the past week. Prices are fairly firm, although some off-grade iron made by furnaces producing specialties has been offered at reduced prices. For the regular grades there has been comparatively small demand and furnacemen are not pushing very persistently for orders, and have apparently let some business go to other producing districts rather than compete for it at the lower prices named by the outside interests. In one instance the business was taken on account of lower freight rates from the other producing district to destination. For current and second and third quarter deliveries we quote as follows, per gross ton, f.o.b. Buffalo:

No. 1 foundry.....	\$18.00 to \$18.25
No. 2 foundry.....	17.50 to 18.00
No. 2 plain.....	17.00 to 17.50
No. 3 foundry.....	17.00 to 17.25
Gray forge.....	16.75 to 17.00
Malleable.....	17.50 to 18.00
Bessemer.....	19.50 to 19.75
Basic.....	18.00 to 18.50
Charcoal.....	20.50 to 21.00

Finished Iron and Steel.—Specifications against contracts are coming along in very satisfactory volume. In new business the demand for cold rolled bars is unusually heavy, especially for screw stock sizes and the demand is good in bar products and other finished lines, new orders coming in about keeping pace with the shipments from the mills on old contracts. The delayed deliveries for steel bars

are causing some consumers to fall back on iron bars, especially those who were familiar with the use of iron before they adopted steel. The total tonnage on this account so far does not amount to much; but it helps a little to relieve the congested conditions for steel. The principal interest reports more pressure noticeable for structural delivery, especially in the Canadian export trade, and that some prices quoted by European mills have been shaded to a point lower than prices made by American mills for prompt shipment; but the tonnage resulting to foreign mills has not been very great as yet, the prospect being for a firmer tone in the foreign market with an increase in prices in the near future. In the local field the demand for structural material continues good, work on a number of structures of importance going forward with a fair degree of rapidity during the winter season. Bids were opened this week for the steel for the machine shops addition to the Otis Elevator plant, 650 tons, and for steel for the Standard Mirror Company's factory, 150 tons, the Charles F. Ernst Sons Iron Works being the low bidder in both instances.

Old Material.—The market still remains stagnant. At the same time it is difficult to buy at prevailing prices, as the dealers are comfortably situated and are not carrying as heavy stocks as they were some few months ago, and are therefore in position to await developments. The consuming interests are also fairly well supplied, consequently the only material moving, practically, is that on old contracts. The following schedule of prices fairly represents the market, though largely nominal, per gross ton, f.o.b. Buffalo:

Heavy melting steel.....	\$16.00 to \$16.50
Low phosphorus steel.....	19.50 to 20.00
No. 1 railroad wrought.....	16.50 to 17.00
No. 1 railroad and machinery cast scrap	16.00 to 16.50
Old steel axes.....	20.00 to 20.75
Old iron axes.....	25.00 to 25.50
Old car wheels.....	17.50 to 18.00
Railroad malleable.....	16.50 to 17.00
Boiler plate.....	13.50 to 14.00
Locomotive grate bars.....	13.00 to 13.50
Pipe.....	13.50 to 14.00
Wrought iron and soft steel turnings..	10.50 to 11.00
Clean cast borings.....	9.00 to 9.50
No. 1 bushing scrap.....	13.50 to 14.00

Birmingham.

BIRMINGHAM, ALA., January 31, 1910.

Pig Iron.—The tonnage engaged the past week was fairly attractive in the aggregate and the prices received were indicative of additional strength, both for early shipment and for delivery in the first half. It is now generally understood that anything to be had on a basis of \$14, Birmingham, is for strictly first quarter shipment, but one or more cases are on record where firm offers at such figures secured delivery of round tonnages through the second quarter. Some iron for strictly second quarter delivery was sold at \$14.50, Birmingham, and where lower grades than No. 4 foundry are to be had, a differential of 25c. per ton on the No. 2 foundry price is obtained without difficulty. Special analysis iron and high manganese sold during the week at \$15, Birmingham. An aggregate of 6000 tons of the last named is reported sold since January 1, at \$15 and better, owing to the delivery stipulated. Reports from all sources indicate shipment against contracts at rates originally agreed upon, and that the tonnage is being consumed, but a lack of interest in second half requirements is generally noted. The quotation of the majority of producers for third quarter deliveries is \$14.50, but in the absence of sales the market value of such deliveries is not definitely determined. It has been intimated that a leading interest would accept deliveries covering the remainder of the year at \$14.50, Birmingham. The melt has increased materially since January 1, and the outlook for all lines of the foundry trade is considered exceptionally good. However, melters without exception complain that selling prices of finished products have not advanced in full sympathy with the advance in price of pig iron, and that fact must, of course, be taken into consideration in judging the situation. It is believed that developments during the next fortnight will indicate to an appreciable extent what is to be expected as to last half commitments.

Cast Iron Pipe.—The volume of business transacted in this market in the past week compares favorably with the record of the week previous, although a larger number of considerations is probably represented. There has been as yet no definite announcement relative to certain significant lettings expected during the early spring, but general indications favor an unusually strong demand and producers are quite willing to stock all pipe now being produced that cannot be readily applied against contracts. It is noted that the severe weather has resulted in holding up more or less on all shipments to the Northwest, which has in turn resulted in what appear to be surplus accumulations. All plants are in steady operation and the aggregate output is normal. We quote water pipe firm for carload lots per net ton, f.o.b. cars here, as follows: 4 to 6 in., \$25; 8 to

12 in., \$24; over 12 in., average \$23, with \$1 per ton extra for gas pipe.

Old Material.—The number of inquiries has increased perceptibly, but so far the actual movement to consumers is apparently unaffected. Dealers continue to add to their stocks whenever practicable, especially of wrought and steel grades. Prices as last published are being adhered to closely and are nominally as follows, per gross ton, f.o.b. cars here:

Old iron axes.....	\$20.00 to \$20.50
Old iron rails.....	16.00 to 16.50
Old steel axes.....	19.00 to 19.50
No. 1 railroad wrought.....	14.50 to 15.00
No. 2 railroad wrought.....	12.00 to 12.50
No. 1 country wrought.....	11.50 to 12.00
No. 2 country wrought.....	11.50 to 12.00
No. 1 machinery.....	13.00 to 13.50
No. 1 steel.....	12.25 to 12.75
Tram car wheels.....	12.50 to 13.00
Standard car wheels.....	14.50 to 15.00
Light cast and stove plate.....	10.50 to 11.00

San Francisco.

SAN FRANCISCO, CAL., January 26, 1910.

While arrivals by sea this month have been extremely heavy, there has been considerable delay in rail shipments from the Eastern mills, and a marked shortage is noted in certain lines of finished products. Supplies of structural shapes, on which deliveries have been slow for some time, are very light, and some difficulty has been experienced in procuring certain small shapes required for work in hand. The movement in most lines has increased somewhat within the last two weeks, with numerous orders for extended delivery from local merchants; but the market shows less activity than was generally expected. The jobbing market remains comparatively quiet, with an apparent tendency on the part of the smaller consumers to withhold their orders for the present, and jobbers are anxious to move a part of their present large stocks before buying heavily for the future. While some interests are inclined to revise their early estimates of prospective business in this territory, there is general confidence that a resumption of the former activity will take place within a few weeks. A very firm attitude is maintained in regard to prices, which in most departments are governed by those ruling in the East. There is less encouragement than formerly to place orders with foreign interests, as the increasing demand for ocean tonnage has caused an advance in prices at which material can be landed here.

Rails.—Recent orders for standard sections have been of small consequence, though some of the coast railroads are now coming out with fair inquiries, and bookings may shortly show some increase. The movement of light rails remains fairly steady, with an increasing tonnage for early delivery, as plans for mining and logging development for the coming season take definite shape. The most notable development is in the line of logging roads, many of which are now using heavy rails. Important extensions are planned in such operations by both local and Northern interests, and there is a noticeable tendency to increase the weight of both equipment and rolling stock.

Bars.—Bar orders from consumers are not yet coming out on as large a scale as was expected, though the tonnage is steadily increasing, and many new inquiries are being received. Supplies of most descriptions are large, but some sizes are rather scarce, owing to delay in the arrival of rail shipments. Merchants are placing conservative orders for later delivery, but experience considerable difficulty in getting small orders filled for early shipment. There is still some uncertainty regarding the extent to which the foreign bars now arriving will replace domestic material, but unless the year's requirements fall far below present estimates the tonnage from domestic mills will not be greatly diminished. Purchases from importers are not of much magnitude at present, and the lowest price at which foreign bars can now be landed here is about 1.85c. Jobbing prices remain very firm, but no advance has occurred, bars from store, San Francisco, being quoted at 2.50c. for steel and 2.30c. for iron.

Sheets.—The demand for both black and galvanized sheets is more active than during the greater part of last year, and local consumers are well occupied. The outlook for the year is good. Stocks are moderate and jobbers are ordering liberally.

Structural Material.—Few fabricating orders of any consequence have been placed recently. While local building operations are again increasing, attention is turning mainly to small structures of the class C and reinforced concrete types. Plans for large projects are taking shape but slowly, and a number of important jobs which were talked of several months ago have been postponed indefinitely, though structural orders for several are likely to be placed at any time. Many smaller jobs are now before the fabricators for estimates, and a fair tonnage is likely to be taken early next month. The Smith-Rice Company has taken the contract for delivering and erecting

steel for the Children's Hospital, at \$9.50 per ton. The Judson Mfg. Company is to furnish a small tonnage for the Wm. Ede Company's building on Market street, near Seventh. Plans are announced for another large theater building in this city, but nothing definite in this connection is expected for some time. Several school buildings are in prospect, but aside from this plans for municipal work have not taken definite shape. The contract for the Yeon Building at Portland, Ore., is still withheld, but several other jobs are in prospect in the northern cities. Plans are under way for bank buildings in various parts of California, which are likely to require a fair tonnage in the aggregate. Competition for fabricating work is expected to be somewhat keener than during the last quarter of 1909. Several Eastern interests, which for a time took very little work in this territory, are coming into the market more actively, though the small jobs which form the bulk of the work in prospect do not greatly attract them. One of the larger local shops, which has been well filled up since last summer, is now completing several jobs and making estimates on most of the work which has come up since the first of the year. There is accordingly somewhat less firmness in regard to fabricating prices. Plain material is rather scarce here at present, and while large shapes are coming out in good time it is very difficult to get quick delivery on the smaller sections called for by much of the work in prospect. Beams and channels, 3 to 15 in., from store, San Francisco, are quoted at 2.70c.

Pig Iron.—The immediate demand is confined to narrow limits locally, though there is a fair movement to other Pacific Coast points. While arrivals have not been excessive, considerable stock is still held by importers, and the larger foundries are well supplied. Few sales are made for future delivery, as there is no likelihood of any scarcity, though the outlook for foundry work is much better than a year ago. Domestic iron is nominal in this market, as none of any consequence is used here at present. Foreign iron is quoted as follows: Chinese, \$25; English and Continental, \$23 to \$24.50.

Cast Iron Pipe.—Bookings are still comparatively light, but several municipal contracts have been let, and the inquiries coming up are very encouraging. An order has been placed for 250 tons for Calexico, Cal., and 500 tons has been ordered for Colusa, Cal. The Long Beach Water Company is in the market for 750 tons, and the town of San Bernardino is preparing to order a considerable tonnage in small lots during the year, to replace the old water system. Sacramento, Cal., will shortly take bids on a large lot of 6-in. and 12-in. pipe, and Vallejo, Cal., is in the market for a lot of 4-in. The refusal of the city to purchase the Spring Valley system will doubtless cause some delay in the placing of large orders for local work. Figures are now being taken by a number of the smaller towns, and several fair orders are expected from this source during the second quarter.

Merchant Pipe.—The current jobbing movement, while fair for this time of year, shows less recovery than was anticipated, and most consumers appear to be amply supplied for all immediate requirements. Jobbers are also carrying fair stocks, and so far show no disposition to come into the market in a large way. A fair tonnage of oil well supplies is being ordered in view of the large developments in prospect for next summer, and from now on a steady increase is anticipated in this department. Jobbing prices are steadily maintained.

Old Material.—There is still a considerable movement of steel scrap for shipment East, prices remaining fairly firm. Cast scrap is showing more activity, with fair sales of heavy material to outside foundries. Local foundries are buying in small lots, as most of them are well supplied. Old railroad material is quiet. Prices show little change, cast scrap being a little stronger, at \$17 to \$17.50 per gross ton. Steel melting scrap is moving at about \$11 per gross ton; railroad wrought scrap, \$13, and rerolling rails, \$12 per net ton.

S. M. Vauclain of the Baldwin Locomotive Works is spending the week in San Francisco.

The Holt Caterpillar Company, recently incorporated at Stockton, Cal., as a branch of the Holt Mfg. Company of that city, is starting a factory at Peoria, Ill., for the manufacture of "caterpillar" agricultural engines.

R. C. Porter, manager of the Eureka Foundry, Eureka, Cal., has been succeeded by C. W. Pickett. The company plans extensive improvements this year.

The city of Seattle, Wash., has called for bids on a number of machine tools to be used by the Board of Public Works.

The Clark County Iron Works has been incorporated at Vancouver, Wash., with a capital of \$15,000, by E. H. Wright, C. A. Harlett, C. B. Hirschbuhl and M. Walch.

The Monterrey Steel Company, Monterrey, Mexico, announces plans for this year involving the expenditure of \$500,000 on improvements, including the addition of a new 200-ton mixer.

The Southern Pacific is reclaiming a tract of land in

Alameda, Cal., to accommodate its new car shops, to be used in connection with the electric suburban system. Several large steel buildings will be erected.

St. Louis.

ST. LOUIS, January 31, 1910.

Important enlargements of foundry plants in this territory in the near future will very materially broaden the demand for pig iron and are an encouraging sign of a growing outlet for the finished material. The Missouri, Kansas & Texas Railroad has placed an order for 1000 new freight cars. Inquiries for standard rails are becoming more numerous. Of interest to shippers of architectural iron is the ruling of the Western Classification Committee to the effect that less than carloads will take a fourth class rate, and allowing a fifth class rate on carloads, with a maximum of 36,000 lb. The more favorable weather conditions which have prevailed for the past 10 days have permitted the resumption of building operations and stimulated business in that line.

Coke.—Business in coke is characterized by a steady demand, mainly for early shipment, though there are some transactions covering the first half. Trade continues moderate in volume, and there is not much disposition manifested to make long time contracts. Prices remain unchanged, but there is a firmer feeling. Deliveries are freer and there is not so much delay in transportation. We quote for 72-hour foundry, standard Connellsville, \$3 for prompt shipment, and \$3.25 for shipment over the first half, to \$3.50 for shipment over the entire year, per net ton, f.o.b. oven.

Pig Iron.—All the leading sales agencies report a more active inquiry. A fair percentage of orders was booked last week for various grades and kinds of pig iron. Among the large inquiries, or at least intimations of a disposition to take on basic pig iron, may be mentioned a large local concern that is in the market for a round lot for shipment over the last half. We also hear of an inquiry for 1000 tons of malleable pig iron for shipment over the first and second quarters and an inquiry for 600 tons of Southern No. 2 foundry. One house reports sales of malleable pig iron aggregating 3700 tons and 2000 tons of foundry pig iron to Quincy stove manufacturers. An inquiry for 1500 to 2000 tons of malleable for delivery over the last half is reported by another seller who has booked several contracts ranging from 100 to 800 tons. Some brokers mention being in receipt of several requests to have shipments resumed on contract. Prices are unchanged, so far as shipment for the first half is concerned, but 50c. advance is asked for the last half. There is a firmer feeling with a confident belief in a gradual increase in the demand. We quote for Southern No. 2 foundry, for shipment over the first half, \$14; for shipment over the last half, \$14.50, f.o.b. Birmingham; southern Ohio, \$17 to \$17.50, f.o.b. furnace.

Finished Iron and Steel.—For structural material there is some improvement in the demand. In standard rails the leading interest reports being in receipt of three or four good inquiries. Light rails are in better demand, coming from coal and lumber interests. The call for both iron and steel bars shows no decrease and buyers are very urgent for less delay in shipments. There continues to be a steady demand for all kinds of track material.

Old Material.—So far as any improvement in the inquiry from consumers, there is no change to report, but, as usually is the case, dealers are doing some trading among themselves. This business and the filling of specifications on contract are about all there is to engage dealers' attention. There were no railroad offerings reported last week. In the absence of a consumptive demand prices are not strongly held. With this notation we quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails.....	\$16.00 to \$16.50
Old steel rails, rerolling.....	15.50 to 16.00
Old steel rails, less than 3 ft.....	14.50 to 15.00
Relaying rails, standard sections, subject to inspection.....	25.00 to 25.50
Old car wheels.....	17.50 to 18.00
Heavy melting steel scrap.....	14.50 to 15.00
Frogs, switches and guards, cut apart.....	14.50 to 15.00

The following quotations are per net ton:

Iron fish plates.....	\$14.50 to \$15.50
Iron car axles.....	20.50 to 21.00
Steel car axles.....	19.50 to 20.00
No. 1 railroad wrought.....	15.50 to 16.00
No. 2 railroad wrought.....	14.50 to 15.00
Railway springs.....	13.00 to 13.50
Locomotive tires, smooth.....	16.00 to 17.00
No. 1 dealers' forge.....	11.50 to 12.00
Mixed borings.....	8.00 to 8.50
No. 1 busheling.....	13.00 to 13.50
No. 1 boilers, cut to sheets and rings.....	11.00 to 11.50
No. 1 cast scrap.....	13.50 to 14.00
Stove plate and light cast scrap.....	10.00 to 10.50
Railroad malleable.....	12.00 to 12.50
Agricultural malleable.....	9.50 to 10.00
Pipes and flues.....	10.50 to 11.00
Railroad sheet and tank scrap.....	9.50 to 10.00
Railroad grate bars.....	10.50 to 11.00
Machine shop turnings.....	10.50 to 11.00

Lead, Spelter, Etc.—The market for lead is lower at

4.55c. and slow. Spelter is weaker and offered at 5.85c., East St. Louis. Zinc ore is lower and held at \$46 per ton, Joplin base. Tin is 20c. per 100 lb. higher; antimony is ruling at last week's figures; copper is 5c. per 100 lb. lower. The demand for finished metals is quite satisfactory, being better than last month.

Among recent incorporations are the following:

International Burglar Alarm Company, St. Louis; capital stock, fully paid, \$100,000; incorporators: Garrett Brown, John G. Ayars, Clair S. Dyas and James M. Butcher.

Hall Safe & Fixture Company, St. Louis; capital stock, fully paid, \$25,000; incorporators: E. F. Hall, L. W. Post and G. T. Breen.

Increase of capital:

Burns Machine Company, St. Charles, Mo., from \$10,000 to \$15,000.

Scullin-Gallagher Iron & Steel Company, St. Louis, from \$750,000 to \$1,500,000, fully paid. The assets of the company are placed at \$2,656,302.28 and liabilities at \$1,686,671.01.

The German Iron Market.

BERLIN, January 20, 1910.

As the month progresses it becomes more and more evident that the quiet that reigned in the market around the holiday season has been followed by increased activity. The general tendency of the news from the trade in the past week has been more favorable. The stock market is taking a more hopeful view of the outlook this week, encouraged partly, too, by the improving news from the United States.

The news of chief interest is the announcement that most of the furnaces of the Lorraine-Luxemburg District have formed a selling agency for disposing of their product under uniform conditions; and this organization has been greeted as foreshadowing a probable reorganization of the pig iron trade in the great Rhenish-Westphalian District. The new organization adopted a scale of minimum prices which in most numbers indicates an advance. Present Lorraine prices are reported to be from 2 to 3 marks a ton above those that ruled about the middle of December. No. 3 foundry can no longer be bought there at less than 55 marks. At the meeting for the formation of the new organization it was stated that all the furnaces are sold out till the end of June, and even for the second half of the year only small amounts are still obtainable. The native ores of that region have been slightly advanced in price. Ore prices are also somewhat higher in Siegerland, and the furnaces there are calling for the delivery of ores at a brisker pace. The imports of foreign ores in the first half of this month assumed very large dimensions.

From the Rhenish-Westphalian District the news this week indicates that pig iron prices continue firm. At Duisburg, according to a dispatch of to-day, the price of English foundry iron and hematite has risen 1 to 2 marks a ton, owing to the rising tendency in England during the past fortnight. But little English iron is now coming into Germany. The selling agency of the Silesian furnaces has also just added 1 to 2 marks a ton to its prices.

In more finished products the state of business continues to improve and the tendency of prices is still upward. In bars the orders for the June quarter are of increasing volume. The minimum price recently adopted by the combination is willingly paid by consumers, and some of the mills are already asking 112 marks. The demand from foreign markets remains satisfactory; export prices have risen to 105 to 106 marks. The ordinary commercial forms of wrought iron bars are in better demand, at 130 marks. The recently adopted price of 132.50 to 137.50 marks for bands and strips is readily paid by buyers, and considerable business has already been done for the June quarter.

The market for plates has undergone a good improvement. In light plates business is very lively and the mills are mostly unable to deliver in less than two months. The prices for this class of products have been steadily rising and now average about 135 to 137.50 marks, while some special brands are held at 145 marks. The business in heavy plates also continues to improve since the recent advance in prices; nevertheless some of the mills still complain of an insufficiency of work on hand. Heavy plates of soft steel now cost at least 117.50 to 122.50 marks, while boiler plates are going at 127.50 to 132.50 marks.

The business in wire rods, wire and wire nails continues active at firm prices. The trade in cast iron pipe is not doing well. Prices have recently been cut in a fight between the syndicate controlling this specialty and several outsiders, but even this has failed to bring out buyers in satisfactory numbers. This appears to be about the only section of the trade that is in a really bad way.

The news this week from the hardware trade indicates that conditions continue to improve. Builders' hardware is being called for in larger quantities for an expected animation of the building trade in the spring. The demand for tools is better. Machinery shops, foundries and construction shops all report improving trade, but most of them are not satisfied with prices.

Cleveland.

CLEVELAND, OHIO, February 1, 1910.

Iron Ore.—The market has been generally quiet during the week, although a few fairly good sized lots were sold. During the recent buying movement a number of makers of foundry iron purchased only a portion of their expected requirements of foundry ore and orders for considerable tonnage of high phosphorus ore are expected to come from this source later. Aside from a few purchases previously noted the Eastern furnace interests are as yet showing no interest in Lake Superior ores and say they are not yet ready to buy. The movement of ore from Lake Erie docks is good, considering weather conditions that make its handling difficult. Dock shipments at present are ores for Bessemer and basic iron. Other orders to begin shipments as soon as the weather moderates have come in, so that a heavy movement from the docks to the furnace yards is expected when the weather becomes more favorable. We quote prices as follows: Old range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old range non-Bessemer, \$4.20; Mesaba non-Bessemer, \$4.

Pig Iron.—Nearly all the furnace interests have opened their books for last half tonnage, and considerable iron for that delivery has been sold in this market during the week for delivery outside of this immediate territory. Most of the sales were foundry iron, but there were several lots of malleable. For delivery through the last half \$17.50, Valley furnace, is the usual asking price for No. 2 foundry, but it is understood that that price is being shaded to \$17.25 by one or two furnaces. Local furnaces are asking \$17.50, at furnace, for that delivery for outside shipments and about \$18.25, delivered, Cleveland. As far as this immediate territory is concerned, the market continues very quiet. Furnacemen are showing some concern over the fact that the demand for first half foundry iron is very limited. While consumers pretty generally covered during the latter part of last year for the first half, and particularly for the first quarter, the demand for delivery before July 1 so far this year is lighter than had been expected, and some sellers are anxious to take on tonnage both for spot shipment and for the first half. For those deliveries No. 2 foundry is quoted at \$17, Valley furnace. The Canton, Ohio, steel interest that had an inquiry out for 6000 tons of basic for delivery during the last half of the year bought that tonnage in the local market, one-half going to a Cleveland furnace and the remainder to be shipped from a Valley furnace. The price is understood to have been between \$17 and \$17.25, at furnace. One or two sellers are offering Southern iron in this territory for the last half delivery at the first half price of \$14, Birmingham, for No. 2. There is still a fair volume of inquiry for last half delivery iron, the largest ones pending being for 5000 tons of malleable and for 3000 tons of foundry. For prompt shipment and the first quarter delivery we quote, delivered, Cleveland, as follows:

Bessemer	\$19.90
Northern foundry, No. 1	\$18.25 to 18.40
Northern foundry, No. 2	17.75 to 17.90
Northern foundry, No. 3	17.25 to 17.40
Gray forge	17.15 to 17.25
Southern foundry, No. 2	18.35
Jackson County sliver, 8 per cent. silicon	21.55

Coke.—Considerable furnace coke for prompt shipment is being offered at lower prices than have prevailed recently, ranging from \$2.25 to \$2.35 per net ton, at oven. For the first half delivery prices remain about stationary at \$2.65 to \$2.75, at oven. There is some demand for small lots of foundry coke for prompt shipment. We quote Connells-ville 72-hour foundry coke at \$2.90 to \$3.15 for spot shipment and \$3.15 to \$3.25 on contract.

Finished Iron and Steel.—Mills are getting a fair volume of specifications and new business, some of the selling agencies reporting an improvement over the previous two or three weeks. The demand for steel bars is holding up well, and a number of additional contracts have been placed for delivery during the first half. A few consumers have asked for contracts for the last half, but mills are declining to quote beyond July 1. With the present congested condition of the mills, however, contracts for delivery until July virtually mean shipments through the third quarter. Prices on steel bars for delivery in this territory continue firm, at 1.50c., Pittsburgh. The demand for plates shows some improvement, boiler, tank and structural shops having come into the market for considerable tonnage for their first half requirements. Prices on plates are slightly easier. Some of the mills that have been holding firmly to the 1.60c., Pittsburgh, price, are getting in better shape on deliveries and are taking on desirable tonnage at 1.55c., Pittsburgh. Others adhere to the 1.60c. basis. With better deliveries by some of the mills the demand for plates for spot shipment at premium prices has fallen off. The structural situation is quiet, but considerable new work is expected to come out shortly. Some additional tonnage has been contracted for by local structural shops. The price is fairly firm, at 1.60c., Pittsburgh, but one or two mill agencies will shade this to 1.55c. on a desirable order. The demand

for sheets continues quite active, and while many of the larger mills are three months or more behind on deliveries, some of the smaller mills are still able to make reasonably prompt shipment. Inquiries for forging billets are less active, local consumers being covered for their early requirements. The demand for shafting has improved and is now fairly good. The bar iron situation continues quite satisfactory. Some new business is coming out, and with specifications on contracts local mills are filled up for about two months. Prices are firm, at 1.60c. to 1.65c., Cleveland. Jobbers report an improvement in warehouse business, which is now very good, although less in volume than during December.

Old Material.—The market is fully as dull as at any time since the present spell of inactivity began several weeks ago. There is some demand from the mills for car lots, but no inquiries are coming out for future deliveries. The large consumers seem to be still pretty well covered, and all they are buying are small lots for immediate requirements. Dealers are surprised at the long continued dullness, but feel that the demand must improve soon. The Erie Railroad closed February 2 on about its usual list, and the Pennsylvania Lines West February 3 on a large list. Prices remain stationary, many quotations being largely nominal. Prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	\$16.25 to \$16.75
Old iron rails	20.00 to 20.50
Steel car axles	20.50 to 21.00
Old car wheels	17.00 to 17.50
Heavy melting steel	18.00 to 18.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	14.50 to 15.00
Railroad malleable	16.50 to 17.00
Light bundled sheet scrap	11.00 to 11.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	\$21.00 to \$21.50
Cast borings	8.75 to 9.00
Iron and steel turnings and drillings	10.50 to 10.75
Steel axle turnings	12.00 to 12.50
No. 1 bushing	14.00 to 14.50
No. 1 railroad wrought	16.50 to 17.00
No. 1 cast	15.00 to 15.50
Stove plate	12.75 to 13.25
Bundled tin scrap	11.00 to 11.50

Iron and Industrial Stocks.

NEW YORK, February 2, 1910.

Another period of liquidation has been experienced by the stock market. At times the selling of stocks has been quite urgent. Fear of Government action against large corporations has still been the controlling influence. Somewhat reassuring statements have been put forth by the Administration, but they have not been completely satisfying, and recovery from the extreme depression in financial circles has been slow. The range of prices on active iron and industrial stocks from Thursday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.. 12 - 13½	Railway Spr., pref.....105
Allis-Chalm., pref.. 43 - 47	Republic, com.... 85 - 87½
Beth. Steel, com.. 30 - 31	Republic, pref.....100½-101
Can, com..... 109½ - 11½	Sloss, com..... 76 - 78½
Can, pref..... 74 - 76½	Sloss, pref..... 118½-119½
Car & Fdry, com.. 63 - 65	Pipe, com..... 26 - 28
Car & Fdry, pref.. 117 - 118	Pipe, pref..... 77½ - 79
Steel Foundries... 60½ - 61	U. S. Steel, com... 81½ - 84½
Colorado Fuel.... 36½ - 41½	U. S. Steel, pref.. 122 - 123½
General Electric.. 150½-153½	Westinghouse Elec. 68 - 72
Gr. N. ore cert... 71 - 74½	Va. I. C. & C..... 65
Int. Harv., com.. 119½-121½	Chi. Pneu. Tool... 40 - 42
Int. Harv., pref.. 123 - 124½	Cambria Steel.... 48½ - 49*
Int. Pump, com... 48 - 49½	Lake Sup. Corp... 24½ - 25½
Int. Pump, pref.. 86½ - 87½	Penn. Steel, com... 63
Locomotive, com.. 50½ - 52	Penn. Steel, pref.. 114½-115
Locomotive, pref.. 112½-113½	Warwick 11 - 11½
Nat. En. & St., com. 23½ - 24½	Crucible St., com.. 15½ - 16½
Pressed St., com.. 41½ - 43½	Crucible St., pref.. 88½ - 89
Pressed Steel, pref.....105	Harb.-W. Ref., pref..... 63½
Railway Spr., com. 40½ - 45½	

* Ex dividend.

Last transactions up to 1 p.m. to-day are reported at the following prices: United States Steel common 82½, preferred 123½, bonds 105; Car & Foundry common 63½, preferred 118; Locomotive common 51½, preferred 113½; Colorado Fuel 37½; Pressed Steel common 41½, preferred 104½; Railway Spring common 41; Republic common 35½, preferred 100½; Sloss-Sheffield common 78; Cast Iron Pipe common 26½, preferred 77½; Can common 11, preferred 75.

Dividends.—The Pressed Steel Car Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable February 23.

The Jones & Laughlin Steel Company, Pittsburgh, is sending out notices to the trade that the first 12 mill unit of its 36 mill tin plate plant at Aliquippa, Pa., is expected to be in operation in the latter part of April. Special attention will be given to the manufacture of coke tin plate.

New York.

NEW YORK, February 2, 1910.

Pig Iron.—Few transactions are reported for the week in Greater New York or in the nearby districts of New Jersey. Virginia pig iron is more in evidence, lower prices being quoted by one important producer, which are apparently being met by other Virginia sellers, as well as some eastern Pennsylvania and New Jersey furnaces. In New England Virginia irons have been sold at \$15.25 to \$15.50, at furnace, for No. 2, or considerably below the basis established by recent sales of Buffalo District irons. A sale of 1000 tons of foundry iron was made this week to a Brooklyn interest; but small lot business has been the rule. The New York State machinery manufacturer recently in the market is believed to have bought 8000 to 10,000 tons, and is still in the market for an equal tonnage for plants in Massachusetts. Some buying of off grade iron is reported by pipe works and low phosphorus iron—6000 tons to one steel foundry—has been sold at about \$23, delivered in eastern Pennsylvania. The disposition of both buyers and sellers appears to be to postpone negotiations for second half iron until the situation becomes clearer. We quote Northern iron, New York delivery, for the first half of 1910, as follows: No. 1, \$19 to \$19.25; No. 2 X, \$18.75 to \$19; No. 2 plain, \$18.50 to \$18.75. Southern No. 1 is quoted at \$19 to \$19.25; Southern No. 2 at \$18.50 to \$18.75.

Steel Rails.—The Baltimore & Ohio purchases, amounting to 70,000 to 75,000 tons, have been completed. South Chicago and Pittsburgh mills took close to 50,000 tons and an eastern Pennsylvania mill about 25,000 tons. The Philadelphia & Reading has bought 5000 tons additional, which will be rolled at Pittsburgh.

Finished Iron and Steel.—January closed the most quiet month in all lines of finished iron and steel for some time, but nevertheless well ahead of previous first months of other years in the amount of business done. January and February are expected to be dull months in finished steel, but the mills are being kept unusually busy for the season, and now have enough on their books to keep them occupied until about the first of March. The prospect for structural needs are very good, and it is believed that by the middle of March there will be considerable buying. The plate market has not shown any improvement in this territory of late. Steel bar deliveries are still very slow, including even the larger sections, and in general orders for small sections are not wanted. One bar iron mill reports that, although business is not as active in many quarters as it should be, its orders are still large, and that it is no more successful in keeping up with them than it was six or eight weeks ago. During the month of January the American Bridge Company took orders for about 40,000 tons of structural work and the independent fabricators a little over 60,000 tons. Among recent contracts taken for structural work are the following: By the Phoenix Iron Works, a mercantile building at San Antonio, Texas, 1100 tons; Lackawanna Bridge Company, a machine shop for the Buffalo Foundry & Machine Company, 165 tons; American Bridge Company, bridges for the Spokane & Inland Empire Railroad, about 200 tons; Pennsylvania Steel Company, bridges for the Idaho & Washington Northern Railroad, 950 tons; Phoenix Bridge Company, a bridge for the New York, New Haven & Hartford, 105 ft. span single track, about 200 tons; Lackawanna Bridge Company, bridges for the Kansas City Southern Railroad, 600 tons, and by the same company a building for the American Radiator Company at Kansas City, Mo., 900 tons. Contracts for the steel are yet to be placed on the following: Track elevation work at Worcester, Mass., for the New York, New Haven & Hartford Railroad, about 2000 tons, and the work ultimately to be done may require an equal amount more; Rockefeller Building, in Cleveland, Ohio, the general contract for which is held by the Thompson-Starrett Company, about 1000 tons, for which the bids are in, although no decision has been made upon them; Midvale Steel Company, for additions to its open hearth steel plant, the contract for which has been awarded to the Ritter-Conley Mfg. Company, about 1200 tons; loft building at 40 West Twentieth street, New York City, the contract for which has been awarded to the Alfred E. Norton Company, 1000 tons. Bethlehem shapes will be used in the last named and it is stated also that they have been specified for a part of the New York, New Haven & Hartford Railroad Worcester improvement work. The Hudson & Manhattan Railway of Jersey City, for car repair shops, will want about 700 tons, which it is understood is not yet placed. The Ward-Corby Bakery Company is inquiring for two bakeries, one in the Bronx and one in Brooklyn, which will need about 500 or 600 tons each. Still unplaced is the steel for three marine hospitals, to be erected by the Noel Construction Company, Baltimore; one at Norfolk, another at Portsmouth and a third at Chelsea. Bids are being taken for a hotel at 130 West Thirty-seventh street, for 250 tons of structural material. Bids are in for an office building for the Germania Fire Insurance Company, 2000 tons, to be erected in New York City. March 15 bids will be opened at Washington on

a post office for Denver, Colo., to be 175 x 300 ft., four stories, requiring about 2000 tons. Prices in all lines remain unchanged and are quoted as follows: Plain structural material and plates, New York, 1.71c.; steel bars, 1.66c., and bar iron from 1.70c. to 1.80c., according to the grade and quality.

Wrought Pipe.—From December to the early part of February is usually an exceedingly dull period in the wrought pipe trade, particularly in the oil regions. The demand from that section usually springs up in February, but the past week remarkably heavy inquiries and specifications have been coming out. Eastern manufacturers are confidently expecting a very large business.

Cast Iron Pipe.—This branch of trade is not active. While private gas and water companies are still coming in the market to some extent for their season's requirements, municipalities in the East are not by any means prominent among buyers. The city of Schenectady, N. Y., will open bids on about 175 tons February 8 and Medford, Mass., 150 tons February 9. It is likely that after newly elected officers of municipalities have become sufficiently familiar with the affairs intrusted to their charge considerably more business will be announced. Foundries being well supplied with work, prices are firm, though unchanged. Carload lots of 6 in. are quoted at \$25.50 to \$26 per net ton, tidewater.

Old Material.—The market has been exceedingly quiet. The severe weather in December and January caused a great many of the large Eastern consumers to request the suspension of shipments of scrap, as they were in more urgent need of other material, such as coal, ore, &c., and therefore were not in position to handle the scrap if received. At the same time the foreign scrap arriving had to be taken care of at once. These conditions caused some little accumulation of scrap in this vicinity, but it has not been sufficient to cause notable pressure of stock for sale. It is remarkable how well the prices of practically every kind of scrap have held up in the face of the fact that so little has been shipped by the home dealers in the past six weeks. Some consumers are now inquiring for a considerable tonnage of special material. Conflicting views prevail among dealers relative to the immediate future. Some of the largest are quite confident that any change is likely to be for the better in view of the fact that the consumption, especially of steel scrap, continues heavy. The 1200 tons of Panama scrap sold last week went to a local dealer at \$13.30 per gross ton, which was \$1.32 under the price obtained for the previous lot. The following quotations are per gross ton, New York and vicinity:

Re-rolling rails	\$15.50 to \$16.00
Old girder and T rails for melting	14.75 to 15.25
Heavy melting steel scrap	14.75 to 15.25
Relaying rails	20.50 to 21.00
Standard hammered iron car axles	25.00 to 26.00
Old steel car axles	19.50 to 20.00
No. 1 railroad wrought	17.00 to 17.50
Wrought iron track scrap	15.00 to 15.50
No. 1 yard wrought, long	15.00 to 15.50
No. 1 yard wrought, short	14.50 to 15.00
Light iron	9.00 to 9.50
Cast borings	9.50 to 10.00
Wrought turnings	11.50 to 12.00
Wrought pipe	14.00 to 14.50
Old car wheels	15.00 to 15.50
No. 1 heavy cast, broken up	14.50 to 15.00
Stove plate	12.00 to 12.50
Locomotive grate bars	12.00 to 12.50
Malleable cast	16.50 to 17.00

The William J. Breen Company, 84 State street, Boston, Mass., has been given the exclusive agency for the New England territory of the Sloss-Sheffield Steel & Iron Company, Birmingham, Ala., for the Sloss, Sheffield, Florence and Lady Ensley brands of pig iron, to take effect February 25.

Metal Market.

NEW YORK, February 2, 1910.

THE WEEK'S PRICES.

	Copper.			Lead.			Spelter.	
	Jan.	Lake.	Electro-lytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
27.	13.87½	13.62½	32.60	4.70	4.50	6.12½	5.80	
28.	13.87½	13.62½	32.50	4.70	4.50	6.12½	5.80	
29.	13.87½	13.62½	32.40	4.70	4.50	6.12½	5.80	
31.	13.87½	13.62½		4.70	4.60	6.12½	5.90	
Feb.								
1.	13.87½	13.62½	32.70	4.70	4.60	6.12½	5.90	
2.	13.87½	13.62½	32.60	4.70	4.60	6.12½	5.90	

The statistical position of both copper and tin is not good, and spelter has declined again. There was a flurry in lead during the week in St. Louis which sent it lower, but the metal has regained its strength somewhat, although its future is in a measure doubtful. On the whole the metal market is weak.

Copper.—The price of copper has not changed, and, following the optimistic feeling over the restriction of the output, there has developed a feeling of unrest over the

imports. European statistics for the fortnight show that stocks have increased there and figures, now for the first time available, show that shipments of copper into this country, chiefly from South America, during December amounted to 15,000 tons. During the year 1909 the imports were 145,000 tons, while the year before they were only 97,000 tons. Figures for January are not at hand as yet, but it is known that the imports were large. During the week there were sales of electrolytic copper to be delivered in the Naugatuck Valley, 30 days cash, at 13.75c. This is equal to 13.62½c., New York, and that seems to be the price here. There have been but few sales of lake copper and those were very small. Plenty of lake can be had at 13.87½c. Casting copper is 13.50c. at the lowest. The London market has been flat, and the transactions there during the week were largely speculative. Spot copper was sold in London to-day for £59 12s. 6d. and futures for £60 10s. The sales amounted to 600 tons of spot and 1400 tons of futures. The market was easy.

Pig Tin.—Not in the last 12 years has there been nearly so large a visible supply of pig tin as there is at this time. In October of 1898 the visible supply of tin amounted to 22,918 tons and pig tin here was 18.35c., while the price in London was £83 10s. As shown by the monthly statistics the total visible supply of pig tin in Europe and the United States at the present time is 23,024 tons, while the price on January 31 was 32.40c. here. It is evident that while the consumption now is much larger than it was 12 years ago higher prices for pig tin are not warranted, and it is thought in some quarters that they are very much inflated. Spot tin in New York is still concentrated, but the arrival of the Minnetonka yesterday with 525 tons eased the situation slightly, and there are some good quantities afloat in Eastern steamers, which are soon due. The arrivals of tin so far this month have been 675 tons, while there are 3015 tons afloat. Figures compiled by C. Mayer of the New York Metal Exchange show that deliveries into consumption during January were large, amounting to 3500 tons, as against 3200 tons for the same time last year. The combined deliveries for London and Holland for January were six tons less than for the same month last year. Shipments from the Straits for January were 151 tons larger than for the same month last year. Australia shipped 15 tons less in January, compared with the same time last year. The total visible supply January 31, 1910, was 1129 tons above that of January 31, 1909. In London to-day spot tin was sold for £147 15s., while futures brought £149 7s. 6d. The market was steady. The sales amounted to 100 tons of spot and 400 tons of futures.

Tin Plates.—Considerable interest is being taken in the foreign situation, as the reports from a number of sources have it that there is heavy buying abroad on the part of consumers. The price for Welsh plates is the same as last week, 13s. 4½d., but some predict a further advance very soon. The trade in domestic tin plate continues heavy and the price for 100-lb. I C coke plates remains at \$3.84. Substantial premiums are still being asked at the independent mills.

Lead.—There was a flurry in lead in St. Louis last Thursday and Friday and the price dropped to 4.50c. There seems to be no good reason for the break, as no large amounts of lead were offered at that price, nor were there any great transactions. Some people there do not seem to have as much faith in the situation of lead as they did a week ago, however, and the market in the West is uncertain on that account. The New York market remains firm and the leading interest is asking 4.70c., while outside sellers are quoting it at 4.72½c. Sellers here refused to follow the example set by some St. Louis dealers during the flurry and offers made to independents below 4.72½c. were declined.

Spelter.—The market has weakened and plenty of spelter has been offered during the week at 6.12½c. in this market. In St. Louis sellers of spelter seem to have followed the example set by some brokers in lead, as during Thursday and Friday the market broke from 6c. to 5.90c. It came back to 5.90c. on Monday, but the market is ragged, and it would not be surprising to see another decline. In this market buyers are scarce, with the exception that there continues to be a good call for brass mill spelter. On Thursday the price fell off to 6.12½c., where it remained during the week.

Antimony.—There is nothing of interest in the market for antimony, as there is but little buying. Hallett's is 8.25c. and Cookson's is selling for 8.50c. Other brands can be had for 8c. and perhaps slightly less.

Old Metals.—The market is steady. Following are dealers' selling prices:

	Cents.
Copper, heavy cut and crucible.....	13.25 to 13.50
Copper, heavy and wire.....	12.75 to 13.00
Copper, light and bottoms.....	11.75 to 12.00
Brass, heavy.....	9.50 to 9.75
Brass, light.....	7.75 to 8.00
Heavy machine composition.....	12.25 to 12.50
Clean brass turnings.....	8.75 to 9.00
Composition turnings.....	10.25 to 10.50
Lead, heavy.....	4.40 to 4.50
Lead, tin.....	4.05 to 4.15
Zinc scrap.....	5.00 to 5.25

Labor Notes.

Charles W. Eliot, ex-president of Harvard University, George B. Hugo and George H. Ellis have petitioned the Massachusetts Legislature for "an act to provide for the public investigation of industrial disputes and for the prevention and settlement of strikes and lockouts." The bill as drawn by Dr. Eliot provides that it shall be unlawful for any employer to declare or cause a lockout or for any employee to go on a strike on account of any dispute covered by the act, before such dispute shall have been referred to a board of investigation as created by the act. The bill describes the character of disputes to which it is applicable and provides that not less than 10 persons in the same general occupation shall be involved to bring the matter within its provisions. The board of investigation to which disputes are to be referred will consist of three persons, one chosen by the employer, one by the employees or their agent, and a third to be chosen by the two; or, in their failure to agree, he shall be designated by the Commissioner of Labor.

The convention of the United Mine Workers of America at Indianapolis, Ind., decided this week on a demand for 10 cents a ton advance for pick mining and an equivalent advance for machine mining, with a corresponding increase for all day work, dead work, yardage, &c. Further demands include a uniform rate of wages for all classes of inside and outside day labor, time and a half for overtime, Sundays and holidays, and a payment for all coal as weighed before screening. It was decided that the contract period be for two years from April 1, 1910.

Chicago jobbing foundries and manufacturers of machinery who operate their foundries by agreement with the iron molders' union were recently confronted by a demand for an advance in the minimum wage from \$3.25 to \$3.65 a day. This demand was declined by the employers, but after several conferences an agreement was arrived at, effective February 1, allowing the molders an advance of 25 cents per day, making the minimum daily wage \$3.50. This agreement will remain effective until May 1, 1911, and includes about 50 gray iron foundries in Chicago engaged in jobbing work or as manufacturers of machinery. Few of the large manufacturing plants were involved, as with them the use of molding machines is quite general.

C. W. Leavitt & Co., 30 Church street, New York, are distributing a 20-page pamphlet giving a description of the Girod electric furnace and the French works using the Paul Girod steel process, by Dr. Wilhelm Borchers, professor of metallurgy, Royal College of Technology, Aachen, Germany. The names are given of 12 companies now using Girod furnaces. A letter from C. W. Leavitt & Co. states that one of the largest and most prominent steel works in Germany and two prominent American works whose names cannot be disclosed at this time have decided to install the Girod furnace, while negotiations now pending with other large works in this country look favorable for its installation on a large scale in the near future. The pamphlet is profusely illustrated.

Joseph T. Ryerson & Son, Chicago, recently secured a contract for furnishing several very heavy multiple punches to the Pressed Steel Car Company, Pittsburgh. These machines are especially designed for multiple punching of steel underframes. Each machine will approximate 200,000 lb. in weight. The same house has also secured an order for the complete equipment for the new steel car plant of the Merchants' Despatch Transportation Company, East Rochester, N. Y. The equipment consists of hydraulic machinery, punches, shears, pneumatic riveting machines, bevel shears, &c.

The Machinery Trade.

NEW YORK, February 2, 1910.

According to conservative estimates made by representatives of the leading machinery houses, there are inquiries in this market for machinery equipment which involve expenditures amounting to more than \$1,000,000. Not in the last three years has there been such a volume of prospective business before the trade and most of the inquiries on hand are for machinery that must be purchased soon. The Bethlehem Steel Company has a notable list out calling for a larger quantity of heavy machine tools than has been asked for the last two years. The Norfolk & Western Railroad has come forward with a large list and the Kansas City & Southern Railroad is preparing to get bids on a good quantity of motor driven machine tools for its new shops at Shreveport, La. A large list of requirements recently sent out by the Baltimore & Ohio Railroad will be purchased against soon and automobile manufacturers are asking for figures on machine tools for early delivery. In the lists before the trade a large quantity of special machinery is asked for, and this will result in extensions in delivery time on many types of machines coming under this class. This enormous demand is not confined to the East alone, as the Great Northern Railroad is asking for prices on one of the largest lists on record, which is published in our Chicago market.

Other railroads are reported to be preparing for heavy machinery purchases, and if this great demand continues prices are very likely to advance. As the matter stands during the last three months prices have gone up on about every class of machinery equipment. Engines and boilers have been advanced from 5 to 10 per cent., and contractors' equipment, such as steam shovels, derricks, dredging machinery and the like, have been raised 5 per cent., while machines, tools and special machinery have gone up anywhere from 10 to 15 per cent. Prices of machinery castings are stiffening and an increased demand for labor and material will have a decided effect on the machinery trade in the way of changed prices.

The Norfolk & Western Railroad has issued a list from Roanoke, Va., which calls for machine tools, steam hammers, car wheel equipment and some good sized punching and shearing machinery. It is thought that a large part, if not all, of this apparatus, will go to the Roanoke shops. The list is as follows:

Five pipe cutting and threading machines belt driven, for bent pipe or with bent pipe attachment. Quote on machines from $\frac{3}{8}$ in. to 2 in. Get quotations from Merrel Mfg. Company, Toledo, Ohio, on Apex machine, also on Cox machine by Niles.

One drill press 36 in.; belt driven, $2\frac{1}{2}$ in. high speed drill. Quote as an alternate on a 3-ft. simple radial drill.

Four 20-in. belt driven engine lathes, 10-ft. bed, approximately 5-ft. centers. Quote on extra length of bed.

Two five-spindle vertical wood boring machines, with hand and power feed table 10 ft. long. Quote prices per extra foot of table, belt driven.

One band saw, 48-in. wheel, to be equipped with proper size direct connected motor, direct current, 220-volt.

Two heavy 16-in. bolt lathes, taper attachments, back gears. Quote on 6-ft. bed, approximately 2 ft. 6 in. between centers, giving quotations for extra lengths of bed, belt driven. Either Westinghouse, General Electric or Bullock motors.

One double head axle lathe, 8-ft. centers, center drive, $12\frac{1}{2}$ -in. opening in head, two carriages. Motor driven, 220 volts, alternating current three-phase 60-cycle, with inclosed type controller.

One 48-in. car wheel borer, power crane, five-jawed chuck, with hub facing attachment; motor driven, alternating current 220-volt three-phase 60-cycle, inclosed type controller.

One car wheel press, cast steel cylinders, cast steel resistance post, three-plunger pump; minimum 22-in. wheel, maximum 48 in., 400-ton pressure, motor driven, alternating current 220-volt three-phase 60-cycle, inclosed type controller.

One 36-in. belt driven drill press, $2\frac{1}{2}$ -in. high speed drill. Quote as an alternate on a 3-ft. simple radial drill.

One angle cock grinding machine, belt driven.

One 5-ft. semiuniversal radial drill press, belt driven, capable of handling $2\frac{1}{4}$ -in. high speed steel drill, drilling in steel.

One 40-in. rip saw. Quote with and without the self-feed attachment, adjustable table, belt driven.

One double head bolt cutter, capable of cutting bolts up to 2 in., belt driven. List of attachments furnished with machine.

One 600-lb. steam hammer, 22-in. stroke, approximately 7-in. cylinder, capable of using steam up to 160-lb. pressure. Either Westinghouse, General Electric or Bullock motors.

One 24-in. back geared adjustable crank shaper, belt driven.

One 36-in. drill press, capable of using $2\frac{1}{2}$ -in. high speed

drill, belt driven. As an alternate quote on simple 3-ft. radial drill capable of handling $2\frac{1}{2}$ -in. high speed drill.

One portable pneumatic riveter, 36-in. reach, 20-in. gap, 1-in. hot rivets for structural work, equipped with universal yoke, capable of operating at 80 lb. air pressure, and built sufficiently strong to stand 125 lb. air pressure.

One extra heavy double spindle shaper for woodworking, similar to No. $2\frac{1}{2}$, Fig. 929. Clement iron table fitted with special conical boxes, countershaft with guide stands; catalogue of American Wood Working Machinery Company. Name the equipment to be furnished with machine.

One special direct current 220-volt Roth motor for band saw, London, Berry & Norton No. 3 machine to operate at from 550 to 600 rev. per min. Machine to be used for sawing taper on car end sills, and rounding up ends of engine buffer beams, which are approximately 12 x 14 in.; 14 in. deep.

On all alternating current motors, 30 hp. and less, voltage, 220; above 40 hp. the voltage to be 440; inclosed type controllers to be furnished in each case. Either Westinghouse, General Electric or Bullock motors.

One improved driving axle lathe, 14 in. over carriages, 8 ft. between centers. To have carriages front and back. Carriage to have quick power traverse in both directions; also power feed in both directions. Motor driven, direct current, 220 volts; Westinghouse, General Electric or Allis-Chalmers motor, with drum type controller.

One brass turner lathe, 18-in. swing, either from Warner & Swasey or Bardon & Oliver, Cleveland, Ohio, belt driven.

One slab milling machine, 24 in. x 24 in. x 8 ft., motor driven, direct current motor, 220-volt. In making quotations quote on 30 in. x 24 in. x 8 ft. also; quote on variable speed motor in addition to constant speed motor; drum type controller.

One car wheel grinder to grind car wheels up to 42 in., either Norton or Springfield. Motor driven, with alternating current, three-phase, 60-cycle, 220-volt if 30 hp. motor or under; 440-volt if other. Inclosed type controller.

One double head axle lathe, 8-ft. centers, center driven; two carriages, $12\frac{1}{2}$ -in. head opening; motor driven, A.-C. 220 volts, three-phase, 60-cycle motor, inclosed type controller.

Two car wheel borers, 48-in. power crane and hub facing attachment; motor driven with 220 volts, three-phase, 60-cycle, A.-C. motors, inclosed type controller.

Two 28-in. drill presses to take drill up to 2 in. high speed. Machines to be belt driven, power speed. Quote on tapping attachment separate.

Two three-spindle rail drill presses, capable of drilling three $1\frac{1}{4}$ -in. holes at one time, using high speed drill in high carbon rails. Minimum distance between spindles $3\frac{1}{2}$ in., maximum distance between spindles 9 in. Quote on both belt and motor driven machines. If motor driven use 220 volts, three-phase, 60-cycle, alternating current motors with inclosed type controllers.

One heavy frog and switch planer, 42 in. between housings, 16 in. maximum height of cross rail, with three adjustments for the cross rails, $9\frac{1}{2}$, 13 and 16 in., with steel racks, all steel gears, cut from solid. Give maximum cutting speed for high speed steel. Motor driven with three-phase 60-cycle motor, inclosed type controller; use 220-volt for motor if 30 hp. or below and 440 volts if above.

One 1500-lb. steam hammer, single frame, 30-in. stroke, approximately $11\frac{1}{2}$ -in. cylinder; capable of standing steam pressure up to 160 lb. per square inch.

Two $1\frac{1}{2}$ -in. bolt header and forging machines, belt driven.

Two $1\frac{1}{2}$ -in. double head bolt cutters, belt driven; quote on furnishings accompanying machine.

One double end punch and shear, 21 in. depth of throat, capable of punching 2-in. holes in $1\frac{1}{2}$ -in. steel; shearing $1\frac{1}{4}$ x 8 in. flat soft steel or $2\frac{1}{4}$ -in. round. Punch ends arranged for angles 6 x 6 x $\frac{5}{8}$ in.; furnished with architectural jaw on one end; furnish with machine a set of punches and dies; set of shear knives for $2\frac{1}{4}$ in. round; also angle shear blades for punch end. Motor driven, direct current, 220 volts, interpole motor, with drum type controller.

One angle shear for angles up to $\frac{3}{4}$ x 6 x 6 in.; T bars $\frac{1}{2}$ x 4 in.; to be motor driven, alternating current motor, three-phase, 60-cycle, 220 volts. This machine can be purchased from Henry Pels & Co., 90 West street, New York, catalogue pages 14 and 15.

One beam shear, capable of taking I-beams and channels from 3 to 20 in.; to be motor driven, alternating current, three-phase, 60-cycle, 220 volts; purchase from Henry Pels & Co., 90 West Street, New York.

One gate shear, 12 in. depth of throat. Quote on 60, 72 and 120 in.; $\frac{3}{4}$ -in. plates. Quote on motor driven, three-phase, 60-cycle, 220-volt alternating current motor; also on direct connected motor, 220-volt.

One horizontal punch. Quote on 1-in. holes in 1-in. steel plate and $1\frac{1}{2}$ -in. holes in 1-in. plate; 12 in. depth of throat; motor driven, alternating current motor, 220 volts, three-phase, 60-cycle, inclosed type controller.

One double end punch and shear, 54 in. depth of throat, $1\frac{1}{2}$ -in. holes in 1-in. steel plate; 2 in. round; 1 x 8 in. flats.

Also quote on 2-in., 1½-in. steel plate; 2¼ in. round; 1½ x 8 in. flats. Motor driven, alternating current, three-phase, 60-cycle, 220-volt motor, with inclosed type controller.

One 4-ft. semiuniversal radial drill; spindle capable of taking No. 4 Morse taper and capacity for 15,000 lb. at the circumference of a 2-in. drill. Motor driven, with variable speed, direct current, 220-volt interpoler reversible motor, with drum type controller.

Bethlehem Steel to Buy Heavily.

The Bethlehem Steel Company has issued a list covering machinery needed for its gun and projectile manufacturing shops and other departments, which is one of the largest lists put before the trade in the last two years. It is estimated in the trade that the requirements call for an expenditure aggregating \$400,000. The list is sent out by W. M. Tobias, the purchasing agent who recently succeeded R. S. Van Horn, but bidders are requested to consult M. H. Anderson, who can be addressed at the South Bethlehem Works as to the details. Bids are asked on some of the heaviest machine tools that have been called for in this market in many months, and considerable is wanted in the way of special equipment, such as gun boring machines, special grinding machinery for working on guns, &c. Many lathes and planers of numerous sizes and styles are asked for, and there is a good sized list of standard grinders. Part of this machinery is called for because the company, as announced in the last issue of *The Iron Age*, has been given a contract to furnish all of the guns and similar equipment for the two warships of the Dreadnought type, which are to be constructed for the Argentine Republic, one at Quincy, Mass., and the other at Camden, N. J.

The Covington Machine Company, Covington, Va., has made arrangements with the Wiener Machinery Company, 50 Church street, New York, to handle its Eastern sales business. The latter company will carry a large stock of the Covington Machine Company's combination punches and shears and its other equipment, in Jersey City in order to insure prompt deliveries. The Covington Machine Company recently sold a triple combination machine to the Maryland Steel Company, Sparrow's Point, Md.

Bids will be opened February 15 by the Board of Water Supply of the city of New York, Room 910, 299 Broadway, for furnishing 20 5 ft. x 15 ft. sluice gates, 200 operating mechanisms, eight 66-in. stop disk frames, four 66-in. stop disks and three sets of drying shafting for various structures along the line of the Catskill aqueduct at Mt. Vernon, Westchester County, and Brown's Station, Ulster County, N. Y.

R. J. Shields, clerk of the Board of Public Works, Poughkeepsie, N. Y., will open bids February 17 for the following: One 5,000,000-gal. high lift pumping engine, one 5,000,000-gal. low lift pumping engine, one surface condenser and two 125-hp. tubular boilers.

The American Can Company, New York, contemplates improving its plant at Baltimore, Md. Definite plans have not been made as yet.

The Sweet Brothers Paper Mfg. Company, Phoenix, N. Y., is rebuilding one of its plants. Some additional equipment will be required.

A steam turbine power plant of 500-kw. capacity or over will probably be built this summer by the United Light & Power Company, which succeeds the Milton Electric Light & Power Company, at Milton, Pa.

The Hardie-Tynes Mfg. Company, Birmingham, Ala., is doing a large engine business not only in the southern part of this country, but also abroad. Some increase in its manufacturing facilities will be necessary during the year.

A new factory, with motor driven saws, lathes, drills and other woodworking machinery, operated on current from the local electric plant, will be built by the Henderson, Ky., Chair Company.

New pumping units with an aggregate delivery of about 12,000,000 gal. per 24 hours may be provided this year for the water works at Rahway, N. J.

In addition to power plant equipment mentioned elsewhere, the Georgia Railway & Electric Company, Atlanta, Ga., will be in the market for machine tools, as an extensive repair department is to be established in a new shop.

A pumping unit for water distribution will probably be provided this year by the authorities at Fort Erie, N. Y.

Machine tools and other equipment for repair work will be required shortly by the Bowling Green, Ky., Railway Company, which has plans under way for a concrete shop.

It is reported from Shelbyville, Ky., that R. L. Prewitt will be in the market there shortly for boilers, Corliss engine, shafting and belting to provide for operating a new mill.

The Lovell Mfg. Company, Erie, Pa., has placed contracts for about 20 alternating current motors to be used in driving shop machinery.

A small electric generating plant for lighting service will probably be installed in the near future by the Jefferson Iron Company, Birmingham, Ala.

Construction of an improved water works system is under consideration at Milton, Del.

Equipment for an impregnation plant for roofing material

will probably be required in the near future by the Lafean Paper Mill Company, York, Pa., which contemplates construction of a new building for the purpose.

Extensive improvements, including the installation of new machinery, are being made in the plant of the York-Browning Company, Memphis, Tenn., and the scope of its operations will be still further enlarged during the year.

Some steam generating, pumping and conveying equipment will be required this month by the New Jersey Lime Company, Hamburg, N. J. Specifications may be obtained by addressing them direct.

Plans for the construction of a hydroelectric plant of 7500 hp. on the Chippewa River are being completed by the Chippewa River Power Company, Port Huron, Mich. Chas. O. Lenz, 71 Broadway, New York, is the engineer in charge of the work.

J. A. Guiler, Connellsville, Pa., will use for a tinning plant the shop buildings 50 x 80 ft. and 20 x 20 ft. which he plans erecting. Equipment is understood to have been provided for.

The Acme Malleable Iron Works, Buffalo, N. Y., is nearly ready to begin the extension of its foundry, and specifications covering the equipment will probably be given out on or before March 10.

A motor generator set or converter, transformers, &c., will be provided by the New Orleans Railway & Light Company, New Orleans, La., for a new substation.

The Beaumont Traction Company, Beaumont, Texas, is reported to be planning extension of its power plant.

Boilers, heater, pumps, Corliss engines and generators for a power plant of 300 hp. capacity will be purchased at once for the new shops, to be erected by the Oscar Barnett Foundry Company, Newark, N. J., together with cranes, motors and operating equipment.

A large new machine shop will be built in the near future by the Niagara Machinery & Tool Company, Buffalo, N. Y. Construction is not to start before spring, but orders covering equipment may be placed earlier.

Some electric generating machinery and possibly an entire new power plant will be provided this year for the traction system of the Georgia Railway & Electric Company, Atlanta, Ga. Definite plans have not yet been made.

The John Hewitt Foundry Company, East Newark, N. J., will considerably extend its facilities during the year and may purchase some new lifting and conveying machinery this spring.

An engine, generator and other machinery for a complete electric power plant will be required in the near future for the factory which the Whitehall Tatum Company will build at Keyport, N. J.

The Apperson-Lee Motor Company has been organized at Lynchburg, Va., to manufacture and place on the market a new automobile.

Boilers, engine, dynamo and auxiliary apparatus for a power plant of 200 kw. will be required in the spring by the Light Mfg. & Foundry Company, Pottstown, Pa.

The power house of the Aeolian Company's factory at Garwood, N. J., will be enlarged. Boilers, engine driven generators, condensers, pumps, &c., are to be purchased, together with machinery for new shops.

The Wilmot Engineering Company, Hazleton, Pa., is figuring on a gas producer power plant of 300 hp., including probably two electric units of 100 kw. each, air compressor, hoist, &c., for coal operations in the Blue Ridge Mountains.

W. W. and Eli S. Shortridge have organized at Birmingham, Ala., the Chilton Ore & Mining Company to mine and smelt iron ore in the vicinity of Chilton, Ala. It is reported, although without confirmation, that a new blast furnace plant will be erected.

The Thomas Hinds Company has been organized at Malone, N. Y., to establish a foundry and machine shop.

The Oswagatchie Light & Power Company, Gouverneur, N. Y., will be in the market shortly for hydraulic turbines, dynamos, governors, exciters, transformers and switchboard for a large power plant. Details can be obtained in due course by addressing the company directly.

The municipal lighting plant at Emporium, Pa., of which Robert Greene is manager, is to be enlarged this spring and a 150-hp. gas engine and 60-cycle generator, 150-kw., three-phase, will be required; also transformers and meters.

The Talladega Foundry & Machine Company, Talladega, Ala., whose plant was seriously damaged by fire January 21, states that it will rebuild at once and will be in the market for new equipment about February 5.

Philadelphia Machinery Market

PHILADELPHIA, PA., February 1, 1910.

The most interesting feature of the market has been the extended list of tools which the Bethlehem Steel Company has just placed before the trade, which is by far the largest proposition that has developed in this territory for a long time and includes some 130 tools. The inquiry of the Baltimore & Ohio Railroad has not developed into business here.

It is understood that the bulk of the tools inquired for are for Western shops. The Pennsylvania Railroad has, according to local merchants, sent out no further requests for prices, while no orders of any importance have yet been made against recent inquiries.

Machine tool merchants report a comparatively good week. Some few tools have been sold to automobile builders; the bulk of the trade, however, has been of the single tool character, a slightly increased volume of which is to be noted. While the month's business has not yet been fully figured up, January sales will, no doubt, show a comparatively good volume, and in some instances a substantial increase over that of the previous month. The range of tools asked for recently indicates a wider scope, covering the general line pretty fully. Delayed deliveries in some classes of tools continue to interfere to some extent in booking orders. Manufacturers in the majority of cases report a better volume of business. In tools of a special character there has been quite a good demand and the larger proportion of the tool builders are more actively engaged. A decidedly better feeling pervades the whole market; the increased number of inquiries now before sellers, as well as the amount of business in sight, is looked upon as indicative of quite an active year in machinery and tool lines. There has been no betterment as far as the foreign demand is concerned. An occasional inquiry or sale is reported, mostly in equipment of a special nature, but practically no business has been done in tools of the standard types.

A somewhat better business in second-hand equipment is reported. This branch of the trade becomes more active as deliveries harden in new tools, and this influence is being felt in some classes of equipment. There is still, however, room for considerable improvement in the second-hand market. The call for second-hand engines and boilers continues light, particularly in the medium and smaller horsepower. New equipment of the latter type has been in fair demand, particularly in the larger capacities, some few orders for which have recently been booked.

Both iron and steel castings have been somewhat more actively inquired for, and deliveries on the latter have hardened considerably. Practically all of the steel casting plants in this territory are now fully engaged and have a good volume of orders on their books. The same, however, can hardly be said of the gray iron foundry plants, a number of which have not yet attained normal conditions. The demand for machinery castings is, however, reported as being more active.

It is stated that the Sussex Light & Power Company, Laurel, Md., will receive bids until April for a 300-kw. generator and a 450-hp. tandem compound jet condenser engine.

The Bergdoll Motor Car Company, which has been located at Broad and Wood streets, is moving to its new plant at Thirty-first and Dauphin streets, where the new line of Bergdoll automobiles will be manufactured.

Notice of an application for a charter for the Philadelphia & Suburban Elevated Railroad Company has been advertised by Stewart S. Neff, A. L. Phillips, Coates Coleman, C. W. Haines and John H. Hawkins of this city. The company proposes to build a subway under North Broad street and then extend by elevated systems through the northern, northeastern and northwestern section of the city. The petition will be heard by the usual board at Harrisburg on March 1.

The Lebanon Valley Iron & Steel Company, Lebanon, Pa., has been incorporated with a nominal capitalization, under the Pennsylvania laws, and will engage in the manufacture of bolts, spikes and similar products. The company is in the market for bolt and nut machinery of all kinds and expects to be in a position to manufacture some of its products in the next three or four months.

The Chadwick Engineering Works, Pottstown, Pa., has been adding considerably to its equipment recently, but has no particular list of requirements at the present time. Within six or eight months, however, it expects to be in the market for a new power plant consisting of a 150-hp. Corliss type engine, direct connected to dynamo, 220 volts, direct current. Boilers of 200 to 250 hp. for the plant will also be required, but they state that they are not prepared to take this matter up with manufacturers or representatives at this time.

Chicago Machinery Market.

CHICAGO, ILL., February 1, 1910.

The machinery trade is making steady progress and shows a very satisfactory record for the month. The buying is quite general in character and well distributed in every line of machine tools and factory equipment. The railroads have become more active buyers, and two very desirable lists have appeared in the market during January. The Chicago, Burlington & Quincy list was reported recently, and last week the machinery houses had the satisfaction of receiving a much larger list from the Great Northern Railway accompanied by a letter asking prompt bids and the

earliest possible delivery. The following is a summary of the Great Northern list, which has been divided into paragraphs for the sake of convenience in looking it over:

Great Northern Machinery List.

One wood trimmer for general work; one 26-in. pony planer, with countershaft; one vertical hollow chisel mortiser, having a range of chisels up to 1½ in. diameter, mortising 6 in. deep, complete with countershaft; one 28-in. drill press, sliding head, complete with back gear, self feed, automatic stop; one 24-in. jointer, complete with countershaft; one shaper, with two heads and one Dodo head; one 54-in. sandpapering machine, complete with countershaft; one recut band saw, complete with countershaft; one knife grinder; one saw filer for circular and band saws, right hand to grind saws up to 14 in. wide, single mill, with countershaft.

One pipe threading and cutting machine to cut pipe from 2½ to 8 in. diameter, complete with countershaft; one No. 6 cut-off saw, with driving table and countershaft; one 90-in. extra heavy driving lathe with modern attachments, motor driven; one 90-in. quartering machine for right and left hand quartering, with an adjustment for strokes from 12 to 36 in., complete with countershaft; one 7-ft. vertical boring machine to have T slots in table and eight feeds, motor driven; one 400-ton wheel press to be used for wheels 80 in. in diameter, motor driven.

One 16 in. x 8 ft. bed engine lathe, with complete equipment and countershaft; one 18 in. x 8 ft. bed engine lathe, with complete regular equipment and countershaft; one 20-in. shaper, back geared, power feed, complete with vise, &c., belt driven with countershaft; one 24-in. slotter, table 40 in. in diameter, to have longitudinal travel of 48 in., cross traverse of 41 in., motor driven; one radial drill, plain table, motor driven; one 48-in. milling machine, 16-ft. bed, motor driven; one guide bar grinder, belt driven, complete with countershaft; one horizontal boring machine, belt driven, complete with countershaft.

One No. 4 universal high power milling machine, complete with driving head device, heavy vertical attachment, rock cutting attachment and rack indexing attachment, complete with countershaft; one 42-in. vertical milling machine, with circular table of 42 in. diameter, to have T slots for clamping, belt driven, complete with countershaft; one 2 ft. x 26 in. turret lathe for toolroom work, double cross slide collets and all modern improvements, complete with countershaft; one No. 2 universal tool grinding machine, complete with countershaft; one twist drill grinder, to grind drills from ¼ to 2¼ in. and grind drills at any range; one four-spindle drill press, complete with table and countershaft, 120 in. between housings.

One steam hammer, capacity 1200 lb., single frame; one 200-lb. hammer, belt driven; one cold metal saw 36 in. in diameter, motor driven; one single end punch and shear 48 in. throat, to punch 1 in. hole in ¾-in. plate, motor driven; one two-head bolt cutter and threader, complete with pump, countershaft, wrenches and nine sets of interchangeable dies, machine to have lead screw; two 36 in. x 3 ft. lathes, cross feed, single drive, complete with all attachments and countershaft; two No. 3 universal turret lathes with geared friction, complete with countershaft; one 8 in. x 16 ft. toolroom lathe, complete with countershaft.

One 20-in. drill press, sliding head, complete with back gear, self feed, automatic stop; one 20-in. shaper, back geared, power feed, complete with vise, &c., belt driven, with countershaft; one 20-in. shaper, back geared, power feed, complete with vises, &c., belt driven, with countershaft; one automatic rip and cut-off saw; one bulldozer to have a movement of cross heads about 20 in., motor driven; one automatic car gaining machine, with hand feed, table 12 ft. long, complete with countershaft; one 20 in. x 10 ft. bed engine lathe, with complete regular equipment and countershaft; one 24 in. x 14 ft. bed engine lathe, with complete regular equipment and countershaft; one 30 in. x 12 ft. bed engine lathe, with complete regular equipment and countershaft; one 36 in. x 14 ft. bed engine lathe, with complete regular equipment and countershaft.

Two 30 in. x 12 ft. bed planers, to have two heads on cross rail, belt driven, complete with countershaft; one 30 in. x 15 ft. bed planer, to have one head on cross rail, belt driven, complete with countershaft; one 42 in. x 12 ft. bed planer, to have two heads on cross rail and one side head, motor driven; one 20-in. vertical drill press, sliding head, complete with back gear, self feed, automatic stop; one 30-in. vertical drill press, sliding head, complete with back gear, self feed, automatic stop, complete with countershaft; one 48-in. double punch and shear, to have throat 36 in. on one side and 48 in. on the other and to punch 1½ in. hole in ¾-in. plate; one standard multiple four-spindle drill machine, distance between housings to be 7 ft., complete with countershaft; one gap lathe 20 in. and 44 in. x 16 ft. bed, complete with compound rest, taper attachment, with countershaft.

One knife grinder and feed; one universal tool grinding machine No. 2, complete with countershaft; two 30 in. x

10 ft. bed engine lathes, with complete and regular equipment and countershaft; two 20 in. x 10 ft. bed engine lathes, with complete regular equipment and countershaft; two 18 in. x 8 ft. bed engine lathes, with complete regular equipment and countershaft; one 30-in. drill press, sliding head, complete with back gear, self feed, automatic stop; one standard four-spindle drill machine, distance between housings to be 120 in., complete with countershaft; one horizontal punch, depth of throat 12 in., to punch 1 in. hole in 1-in. plate, motor driven; one No. 3 hollow chisel mortiser and boring machine, with single bore attachment to mortise $\frac{3}{4}$ to 3 in. in width and 6 in. deep, complete with drills and countershaft; one No. 3 cut-off saw, with drive, table to be of iron, with countershaft; one No. 3 circular rip saw, with self feeding table of iron, chain feed, complete with countershaft.

One 16-in. hand jointer, adjustable beveling fences, table to be raised or lowered, complete with countershaft; one double spindle shaping machine, spindles to be 26 in. apart, complete with countershaft; one three-spindle vertical car boring machine, with power driven rolls and quick return spindles, complete with countershaft, to bore up to 12-in. holes; one saw filer for circular and band saws, right hand, to grind saws up to 14 in. wide, with countershaft; one automatic car gaining machine, with end feed table 12 ft. long, complete with countershaft; one 200 lb. capacity, belt driven hammer; one gap lathe 20 in. x 44 in. x 16 ft. feed, complete with compound rest, taper attachment, with countershaft; one 28-in. drill press, sliding head, complete with back gear, self feed, automatic stop; one 28-in. draw cut shaper, with reversible quick change automatic feed; one single head bolt cutter and threader, with lead screw attachment, pumps, countershaft and six sets of dies; one 175-ft. steam driven air compressor.

One 7 in. x 7 ft. vertical engine, 200 rev. per min., self-contained, complete with flywheel; one universal tool grinding machine, No. 3; one 42-in. vertical milling machine, circular table 42 in. diameter, belt driven, complete with countershaft; one 20-in. traversing head shaper, power feeds, 6 ft. 6 in. bed, complete with countershaft; one vertical cross compound condensing heavy duty engine for direct connection to 630 kw., with 85 per cent. power factor; one ATB type 72 pole, 630 kw., 85 per cent. power factor; one surface condenser to contain 2800 sq. ft. of cooling surface; one cooling tower to have a capacity of 1500 hp. and to cool water to 70 degrees F. in summer weather.

One 18-in. monitor brass lathe, 6-ft. bed, belt driven, with complete equipment and countershaft; one 16-in. monitor brass lathe, 6-ft. bed, belt driven, with complete regular equipment and countershaft; two No. 3 universal turret lathes, with geared friction swing 18 in., hole through spindle 17-16 in., for brass work, complete with countershaft; two 40 in. upright drill presses, with power, self feed, automatic stop, quick return, four-spindle, belt driven, with countershaft; one No. 4 universal high power milling machine, complete with dividing head devices, heavy vertical attachment, rock cutting attachment, rack indexing attachment, complete with countershaft; one No. 24 shaper, back geared, power feed, complete with vises, &c., belt driven, with countershaft; three 16-in. lathes, 8-ft. bed, with complete regular equipment and countershaft.

Four 51-in. boring and turning mills to take 36 in. under tool holder, motor driven; one extra heavy locomotive rod boring machine, distance between spindles to be 13 ft. 4 in., to bore up to 20 in. in diameter and 20 in. deep; three universal radial drills, plain table, motor driven; two multiple four-spindle drilling machines, complete with countershaft; two 50-in. drill presses (upright), sliding head, complete with back gears, self feed, automatic stop, complete with countershaft and power self feed; one 48-in. horizontal slab milling machine, 10-ft. bed, motor driven; one 8-in. horizontal slab machine, 16-ft. bed, motor driven; one die sinking machine, distance from center of spindle to base of column $12\frac{1}{2}$ in., to have vertical adjustment of knee, cutters from $\frac{3}{8}$ to 3 in. in diameter, belt driven, complete with countershaft.

One 36-in. double head end traversing shaping machine, with 11-ft. bed, machine to have complete power feed attachment, belt driven, complete with countershaft; one 26-in. draw cut shaper, with reversible quick change automatic feed; one 36-in. engine lathe, 10-ft. bed, with complete regular equipment and countershaft; three 24-in. engine lathes, 10-ft. bed, with complete regular equipment and countershaft; one 30-in. engine lathe, 10-ft. bed, with regular equipment and countershaft; one $6\frac{1}{4}$ -in. lathe, belt driven, including rod steam centering sleeve, bar stock feeder, complete with countershaft; two 24-in. turret lathes, complete with tool outfit for chuck work, complete with countershaft; four 36 in. x 3 ft. gap turret lathes, cross feed, single drive, complete with all attachments and countershaft.

One cold metal saw to be 36 in. in diameter; one power hack metal saw; one horizontal boring and turning machine, work table to be 48 in. long by 36 in. wide, and to have longitudinal traverse of 15 in. and 36 in. cross traverse, motor driven; three 24 in. x 2 ft. flat turret lathes, cross

head, single drive, belt driven, complete with countershaft; one 22-in. slotter, table 40 in. in diameter, to have longitudinal traverse of 48 in., cross traverse of 41 in., motor driven; one 12-in. slotter, table to be 24 in. in diameter, to have 18 in. longitudinal traverse and 18 in. cross traverse, belt driven, complete with countershaft; one universal tool grinding machine, No. 2; one traveling head planer for planing locomotive cylinders, motor driven; one vertical key seating machine for shafts up to 12 in. in diameter, to cut slots 12 in. long and 1 in. wide, complete with countershaft; one centering machine, No. 1; one 24-in. drill press, sliding head, complete with back gear, self feed, automatic stop; one 18-in. drill press, sliding head, complete with back gear, self feed, automatic stop; one No. 3 converter for brass used with crude oil.

One bolt header, continuous motion, complete with countershaft, belt driven; one 3-in. forging machine, motor driven; one $1\frac{1}{2}$ -in. forging machine, complete with countershaft, belt driven; two 200-lb. steam hammers, belt driven, complete with countershaft; one two-spindle drill press, spindle to have power speed, friction release, independent quick return, drill heads bolted to rail, complete with table and countershaft; one double punch and shear to have throat 36 in. on one side and 48 in. on the other and to punch $1\frac{1}{8}$ -in. hole in $\frac{3}{4}$ -in. plate, motor driven.

Sears, Roebuck & Co., Chicago, have leased from the Grand Central Market Company a factory building, 47 x 140 ft., at the corner of Loomis and Harrison streets, which they are fitting up for the manufacture of automobiles.

The W. F. Hall Printing Company, Chicago, has had plans prepared for an addition to its plant at Kingsbury and Superior streets. The new addition will have a frontage of one block on Superior street and will be a duplicate of the building now occupied by the company. The plant when completed will have a floor area of 25,000 sq. ft., and will represent an outlay of \$1,000,000.

The Sherwin-Williams Company, Chicago, is erecting a new four-story grinding mill addition to its paint factory.

The Nebraska Portland Cement Company, with an authorized capital stock of \$1,200,000 and with its head offices in Omaha, Neb., is preparing plans for the development of an extensive plant at Superior, Nuckolls County, Neb., a railroad center for southern Nebraska and northern Kansas. The plant when completed will have a capacity of 2500 bbls. of cement a day and will employ about 250 men. It has been announced by the company that crude oil will be used as fuel, and that a pipe line service will probably be established with the oil fields of Kansas, which are readily accessible. The new company has extensive holdings and a plant at Milford, Kan., in the heart of the cement and limestone deposits of the Republican River Valley, and at Superior the company owns 337 acres of rich beds of cement materials. The officers of the company are: C. McLaughlin, president; Capt. C. E. Adams, vice-president and treasurer; H. G. Calkin, secretary and manager. Mr. McLaughlin's present address is 322 Midland Building, Kansas City, Mo., but later it is his intention to locate at Superior.

The Lennox Machine Company, Marshalltown, Iowa, has been reorganized, and between \$30,000 and \$40,000 will be spent within the next few months in putting the machinery and equipment of the plant in first-class condition and for the purchase of additional equipment. No definite plans have been made for an enlargement of the plant, as this feature will be taken care of as the business demands require. Officers of the company under the reorganization are as follows: David Lennox, president; W. C. Boyden, vice-president; W. A. Morey, secretary; Sidney C. Colomb, treasurer.

The American Seeding Machine Company, Richmond, Ind., has completed plans for the erection of an additional foundry and a modern warehouse. The foundry building will be sufficiently large for the employment of 140 molders and their assistants, and work will begin as soon as the weather has modified enough to break the ground. The new warehouse will be used for the storage of the entire product of the Richmond plant, thus giving opportunity for installing machinery in the buildings now used for storage purposes. The company now employs between 700 and 800 men at Richmond, but upon completion of the new additions the number will be increased to about 1200.

The Farley & Loetscher Mfg. Company, Dubuque, Iowa, is erecting a new factory building, 100 x 200 ft., five stories, which it hopes to have ready early in the fall of 1910 for the installation of a complete line of woodworking machinery. The completion of this building will practically double the capacity of the plant. Contracts have not yet been awarded, but bids will be asked in the course of a couple of weeks.

Sealed bids will be received at the office of the City Clerk, Lincoln, Neb., until February 24, 1910, for the furnishing, constructing and erecting all ready to run, at the Hutting lighting station for the lighting and water departments, one 750-hp. cross compound condensing or noncondensing engine, or one turbine engine of the same capacity, to be direct connected to a three-phase 60-cycle alternating

generator, with exciter driven from engine shaft by belting. The cost of these improvements is estimated at \$21,835 by the city's engineer. Roscoe C. Ozman is city clerk.

Bids will be received at the office of the constructing quartermaster, Fort Robinson, Neb., until February 19, 1910, for furnishing all material and labor for addition to and repairing pump house, new boilers, new pump, &c. Plans and specifications may be consulted at the offices of the chief quartermaster at Denver, Omaha, Chicago and St. Louis. Capt. Malvern Hill Barnum, constructing quartermaster.

M. D. Coffeen, 701 Tacoma Building, Chicago, is erecting a large factory building in the northwestern part of the city at Dixon street and Bloomingdale road, which he has leased for a term of years to Boynton & Co., manufacturers of moldings and carvings. The main building will be 80 x 150 ft., three stories, in addition to which there will be a boiler, engine and shaving rooms and a dry kiln 18 x 80 ft. A power plant of sufficient capacity to supply the needs of the company will also be installed. The entire plant will be equipped with automatic sprinklers as a precaution against fires. All machinery to be installed is being purchased by Boynton & Co., and it is understood that orders for only a part of the required equipment for the plant have been placed. It is expected that the new buildings will be ready for occupancy by May 1.

The Steel Roof Truss Company, St. Louis, Mo., incorporated and capitalized at \$25,000, has acquired a site near the railroads in Valley Park, upon which it will erect a plant within the next two months that will employ more than 100 men. The company is receiving figures on the following machinery, tools and material: Punches and shears of various sizes, air compressors, air riveters, air riveting hammers, air drills, triplex blocks with trolley, and also about 100 tons of structural steel and plates.

The Delmar Auto Body & Wheel Company, Indianapolis, Ind., recently organized, has secured a plant in which it has installed a complete line of equipment for the manufacture of automobile bodies and wheels. In another department of the factory the company has installed power machines for making automobile tops. The company is under the management of E. H. Habig and E. E. Weir.

The Marsh-Capron Mfg. Company, manufacturer of concrete mixers, has recently purchased a site containing 4½ acres at Chicago Heights, Ill., on which it will erect a number of new buildings, the main structure involving an expenditure of \$20,000, and will begin business about March 1. The plant will be equipped with new machinery and will be modern in every respect.

The Whitehead & Kales Iron Company, Detroit, Mich., is in the market for a second hand rotary planer.

The Watt Motor Company, Detroit, Mich., recently incorporated with a capital stock of \$200,000, has purchased a tract of land containing 10 acres on the Conant road, between Mt. Elliot avenue and the Grand Trunk Railroad, in Hamtramck, a suburb of Detroit, upon which it will erect a large plant for the manufacture of automobiles. Thomas G. Moorehead, 1120 Chamber of Commerce Building, is secretary of the company.

The Hubbard Steel Foundry Company, which has succeeded the Davidson Foundry Company, at East Chicago, Ind., will considerably increase its capacity. The Blair Engineering Company of Chicago and New York is preparing plans for several buildings in which a 30-ton basic and a 30-ton acid open hearth furnace, molding machines, core ovens, electric traveling cranes, &c., are to be installed.

Cincinnati Machinery Market.

CINCINNATI, OHIO, February 1, 1910.

January's record in the machinery and machine tool manufacturing lines in this market shows variety, and with most concerns in the tool making lines the closing month of 1909 and the opening one of 1910 have been as dissimilar as if they were 12 months apart instead of 30 days. The heavy buying of lathes during December to avoid advances made through the standardization plan, effective January 1, carried with it specifications for some other tools which threatened advances early in the new year, and the result was a heavy volume of business. Upright drills and other heavy machinery were also good sellers. January has been a promising month with most all tool makers in this field—that is, the character of inquiries has been such as to suggest business to come, but orders, save for needed single tools, have been light. Manufacturers here are looking daily for notice of the closing of bids for the International Harvester Company's requirements, also those of the Norfolk & Western Railroad and some 12 machines, mostly lathes, for a large Rochester, N. Y., foundry list, as well as a number of smaller ones from general manufacturing plants in central territory.

Representative tool manufacturers, members of the Cincinnati Metal Trades Association, have been active during the month in matters affecting the future of their plants

along the lines of State and Governmental regulation. At a special meeting of the Executive Committee of the Cincinnati branch, held Thursday at the Business Men's Club, a resolution was adopted advising members to file their schedules in accordance with the requirements of the new corporation tax measure, but under protest, and to pay the tax, also under protest. The Metal Trades Association announces its chief objection to the measure to be the publicity feature, which opens to competitors the way to certain trade facts that have always been jealously guarded as trade secrets. The association also construes the measure as discriminating against the corporation in favor of the individual or copartnership, by forcing the former to pay a tax for the privilege of doing business. This tax, as the members construe it, must be added to the producing cost, in going into the markets of the world, while the individual or copartnership manufacturer escapes. The corporation manufacturers say this is manifestly unfair. The members of the committee were fortified with correspondence from the National Association of Manufacturers and the Cincinnati Association will co-operate with the organization named, whose president is a resident of a nearby city. The tool manufacturers have the credit for taking the initiative in the matter of resisting the Internal Revenue Department's latest ruling. About 60 per cent. of the Cincinnati tool and kindred manufacturing interests are corporations under the ruling of the department.

Preparations have begun for the annual meeting of the Cincinnati Branch, National Metal Trades Association, March 3, and Secretary Manley is busy securing speakers for the several interesting topics determined upon. Of these one will be "The Apprenticeship Scheme of the New York Central Railroad"; another, "Advertising."

One of the largest of the Cincinnati group of lathe manufacturers reports some of the larger sizes coming through, 36 to 48 in., and deliveries on some sizes four to five months behind. The Cincinnati Lathe & Tool Company reports January better, as to sales, than December. This concern is running on full time, frequently overtime, and with a full force. Most popular sizes are 16, 18, 20 and 22 in.

President P. G. March of the Cincinnati Shaper Company, speaking of January business, reports the month's record as much better than last January and the December business as the largest in the 10 years' history of that concern, save one. In 1907 a 100-ft. addition was made to the plant, which because of the depression was not fully utilized until 1909. In the rearrangement of the shop the business of the Shaper Company and that of the Cincinnati Gear Cutting Machine Company was segregated. By contrast with the phenomenal business of the lathe and milling machine manufacturers from automobile concerns during the years of depression the shaper suffered somewhat, but now that general manufacturing has resumed its sway the future of the shaper seems considerably brighter.

Business with manufacturers of upright drills, radials and other heavy tools fell off somewhat during January, and the milling machine makers who are booked ahead for from 30 days to three and four months have made considerable progress, under full and overtime and with full forces, toward reducing the minimum time for deliveries on popular sizes. Woodworking machinery has been in good demand and the prospects are for a record breaking year in that line.

The annual meeting of the Niles Tool Works Company directors was held January 25, at Hamilton, Ohio, and resulted in the election of the following officers: President, James K. Cullen; vice-president, George T. Reiss; secretary, Joseph L. Blair; assistant secretary, Miles T. Watts, Cincinnati; treasurer, C. L. Cornell, New York; assistant treasurer, Lucius B. Potter.

At the annual meeting of the Smith & Mills Company, Cincinnati, manufacturer of shapers, the following directors were elected: Albert S. Smith, James Mills, William Schuchardt, William Nentrup and Oscar Soden. The board re-elected Albert S. Smith, president and treasurer; James Mills, vice-president and general manager; James E. Mills, secretary, and Ernest Mills, superintendent. The business for the year was reported satisfactory.

The Newport Foundry Company, Newport, Ky., at its annual meeting January 26, re-elected old officers and directors as follows: Paul Lindholz, president; Frank L. Gamel, secretary and general manager; H. E. Weber, treasurer, and Charles Dahner, George Meister, Henry Santel and Henry Blotenberg, directors. The report of the president showed that the business of the concern is good and the plant prosperous.

Articles of incorporation have been issued at Columbus, Ohio, to the A. Lotze Sons Company of Cincinnati, manufacturer of stoves and ranges. The capital stock is \$10,000. The Lotze name is one of the oldest in this section in the manufacture of stoves and ranges, and the new title is simply in the nature of a reorganization of the business, with Josephine E. Lotze, Frieda A. Lotze, Helen J. Lotze, Otto J. Winkelman and M. L. Buchwalter as incorporators. The foundry and plant will be located in Court street, between Vine and Race streets.

Fred G. Leidecker, M. V. Hollandworth, M. A. Simms,

C. A. Koontz and E. E. Williams have incorporated at Huntington, W. Va., with principal works in Cabell and Wayne counties, Virginia, to manufacture and sell boilers, engines, oil well supplies, and to operate and maintain foundries. The capital stock is \$50,000.

The Morrison Iron Company is a new incorporation of Norwalk, Ohio, for \$20,000, by William Morrison, Sadie Morrison, Abe Fischer, Lee Morrison, Sam Morrison.

A reorganization of the Consolidated Mfg. Company, Toledo, Ohio, has been effected by the creditors and others interested, who bought in the plant, machinery, tools and stock January 25. The sale realized \$375,000. The new company, which was reorganized under the same name, was incorporated at \$300,000, and Thomas H. Tracy, who was largely instrumental in putting the concern on its feet again, will probably be the president.

The Fort Wayne Electric Company, Fort Wayne, Ind., has put its new foundry in operation. It is said to be exceptionally complete. The building is cement, brick and steel, two stories high and 80 x 180 ft. in dimensions, and absolutely fireproof. A number of original special tools and devices have been installed by Factory Superintendent E. A. Barnes, who occupied his spare time during the two years of depression making a special study of equipment.

It is announced from Jeffersonville, Ind., the home of the Indiana State Reformatory, that the Indiana Chain Mfg. Company will close its plant in a short time. This is occasioned by the order of last May which announced that inmates of the reformatory would no longer be used on contract work. These inmates will now be put in trade schools and given training in other handicrafts.

The C. E. Morris Iron Works Company, Columbus, Ohio, reports that plant in operation to full capacity and prospects better than for five years past. It complains of difficulty in getting raw material.

At the annual meeting of the directors of the Dayton Malleable Iron Company at Dayton, Ohio, Pierce D. Schenck was re-elected president and general manager; S. W. Davies, vice-president; W. H. Cassel, secretary, and Adolph Heinz, treasurer. A new office was created, that of assistant general manager, and Ralph Herbruck, who has been a valuable employee of the concern for many years, was elected to fill that position.

Business men of La Porte, Ind., are anxious that the new foundry to be built for the M. Rumely Company of that city shall be located there, although existing conditions with reference to obtaining space for the erection of homes for workmen in the vicinity are said to be not favorable. The new department is to employ 150 men at the start and is to be of 100 tons capacity.

Cleveland Machinery Market.

CLEVELAND, OHIO, February 1, 1910.

The local machine tool market shows a little more activity than it did during the greater part of January, but it is still comparatively quiet, and the total number of orders that came out during the month just closed was not large. This is attributed mainly to the fact that little business was received from the automobile trade during the month and no large inquiries from any source came out. Small inquiries are now somewhat more plentiful and dealers feel confident that February will make a much better showing. Some inquiries that were out a few weeks ago have not yet resulted in the placing of orders, buyers stating that they had deferred purchases until inventories were over. While local machine tool builders are not getting the volume of business they were during the latter part of last year, the demand continues fairly good and plants as a rule are being operated at full capacity, with plenty of orders on hand to keep them busy for two or three months or longer. The demand for automatic machinery continues good. While the bulk of the recent orders has come from the automobile trade, the general demand from other sources is fairly active. The demand for electrical power equipment has been light during the past month, but the outlook has improved materially, some good inquiries having recently been noted.

Reports from general manufacturing interests in metal working lines continue satisfactory. In the foundry trade makers of light gray castings have about all they can do and foundries running on heavy castings are being operated at nearly full capacity.

In increasing its capital from \$6,500,000 to \$10,000,000 during the past few days the Cleveland Electric Illuminating Company took the first step toward the proposed erection of a large plant for furnishing electricity for light and power. Plans are now being prepared and the company expects to begin the erection of one section of the plant early in the spring. This section will occupy a building about 250 x 300 ft.

The Peerless Motor Car Company, Cleveland, has let contracts for a new foundry building, and in addition to the erection of a power plant previously mentioned, will make other plant extensions early this season. The foundry building will be 50 x 180 ft. in size and three stories high. The

first floor will be used for metal storage, the second for the core room and the third for the molding room for aluminum and brass castings. The company is erecting a body building 53 x 160 ft., and expects to build a forge shop the same size and an extension to the building occupied by the repair department.

The National Acme Mfg. Company, Cleveland, reports that it has more men at work at present than ever before, and some of its departments are working overtime. The company is well filled with work in its screw machine products department, and is still busier in its machinery department, where it is well filled with orders for automatic screw machines for the next four or five months. The company's January sales exceeded any previous month prior to 1909, and its December shipments were the largest in its history. Orders now coming for automatic machines are practically all from the domestic trade. The large increase is due to the automobile trade and allied industries, but a good volume of business is coming from users of automatic machines having no connection with the automobile trade.

The G. H. Williams Company, Cleveland, maker of clam shell buckets, which was recently incorporated under that name, has completed its organization by the election of the following officers: G. H. Williams, president and treasurer; James Mathews, vice-president; E. P. Lord, secretary. The above with J. H. Silliman and C. C. Williams comprise the Board of Directors. The company reports a good demand for its product. During the past week orders have been taken for eight buckets, one for the Round Lumber Company, Portland, Ore.; three for the Cincinnati Equipment Company of Philadelphia; one for the Lambert Hoisting Engine Company, Newark, N. J.; one for the Pittsburgh Plate Glass Company, Pittsburgh, Pa.; one for the Vulcan Steam Shovel Company, Toledo, Ohio, and one for the Perry Sand Company, Buffalo, N. Y. In addition a number of inquiries are pending.

Plans for the erection of a large addition to the plant of the XXth Century Heating & Ventilating Company, Akron, Ohio, were formulated at the annual meeting of the stockholders held last week. John Kerch was re-elected president and general manager; George Maag, vice-president, and P. T. McGuckian, secretary and treasurer.

The Allis-Chalmers Company, through its Cleveland office, has secured the contract for the equipment of the new power plant to be erected for the Ohio State Penitentiary in Columbus. The contract includes two 600-kw. engine generator units, together with the necessary auxiliaries. This company has also just secured from the Toledo Stone & Glass Company, Toledo, Ohio, an order for a No. 12 stone crusher.

The Cleveland Branch of the National Metal Trades Association has set Thursday, March 3, as the date of its annual meeting and banquet. Nominating and other committees have been chosen.

The Sterling Vehicle Company, in which E. A. Allen, formerly secretary of the National Packing Company, and other Chicago men are interested, is negotiating for the establishment in Toledo, Ohio, of a plant for the manufacture of commercial power wagons with trucks having a capacity of from 1½ to 3 tons. It is expected that the old site of the Shelby Tube Company on Dorr street will be secured if the company definitely decides to locate in Toledo.

Milwaukee Machinery Market.

MILWAUKEE, WIS., February 1, 1910.

The difference between demand and deliveries is widening. Inquiries continue to arrive very steadily, and the booking of orders is governed by manufacturers' capacity for the particular class of work specified, rather than by need of the business. Every shop in this section of which the writer has any knowledge is extremely busy, although some departments of the same establishment will be found considerably in advance of others in this respect. Night shifts are increasing. Assembling and erecting work is being pushed everywhere, and field forces have been largely augmented. Foreign trade has become quite lively wherever manufacturers manifest a disposition to go after it, but the comparative ease with which domestic business can be obtained, and the fact that funds are turned over so much more quickly on machinery sold in this country than on orders taken abroad, tends to restrict shipments to other lands. Even Canadian, Mexican and Caribbean trade is not as freely sought as it was only a short time ago. Offerings of second-hand machinery have grown in volume, due to the number of replacements made since the first of the year, but prices for used and rebuilt tools hold up very well.

In the power field internal combustion engines of all kinds, which had a good sale in the fall months, are again coming prominently to the fore. There is a tendency for this demand to concentrate at present on gas producer units of 75 to 150 hp. for driving electric generators. A number of central stations in the Northwest, serving communities of 1500 to 5000 population, or smaller, are either installing or

preparing to install these units, and many owners of shops and factories have recently been investigating the relative efficiency of producer plants, as compared with steam boilers and engines. Manufacturers of gas, gasoline and oil engines will find it to their advantage to devote a good deal of attention to this section of the country.

Analogous to the situation mentioned is the increasing use of improved equipment for iron, steel, concrete and mill construction. Contractors in this State have been very keen lately upon finding methods of expediting outside work, including excavating, filling, framing and building of all kinds, and the manufacturer or dealer who can show a positive, substantiated increase in speed and efficiency, through the use of his apparatus, is sure of a careful hearing.

In connection with new projects the assertion is not infrequently made by manufacturers that advance information published in trade papers concerning impending machinery requirements are of doubtful utility, for the reason that purchasers have practically concluded all of their arrangements for equipment before any facts regarding new shop buildings, extensions or improvements are authoritatively given out. Now regular readers of *The Iron Age* know that a large percentage of its items cover enterprises which, while definitely determined upon, have not yet reached the contract letting stage, and can, therefore, be followed up with benefit when the prospective customers are ready to consider proposals; but, in relation to such items as are published too late to be taken full advantage of, a remark made in the writer's hearing by a Wisconsin tool builder has particular pertinence. This manufacturer stated recently that he made note of, and in some way got in touch with, every new buyer of equipment in his line whom he finds mentioned in *The Iron Age* or other high class journals; not so much with the idea of selling to him then, although he, of course, makes a proper effort to do so, as with the expectation of securing the next order placed for apparatus needed in the same shop. Equipment contracts seldom cover more than the immediate necessities of an establishment. Within a few months, or a year at the longest, some additional machinery is needed, and the man who has kept in touch with the situation usually gets the order, particularly as those who sold the original line are very apt to be satisfied with their success for the time and to be concentrating their efforts elsewhere. There is much food for thought in this fragment of actual experience.

Boilers, Corliss engines, dynamos, motors, shafting, pulleys, belting and woodworking machinery will be required for a new factory to be erected at Plymouth, Wis., by the Plymouth Veneer Company. For details of equipment address the company direct. A part of it is understood to have been already contracted for.

Manufacturers of Sheboygan, Wis., have decided upon an organized effort to obtain new industries and better railroad facilities for that city. W. A. Pfister is at the head of the movement. During the past year there has been a notable increase in the working capacities of local plants, and more machinery has recently been required for new shops, extensions or re-equipment than at any period in the history of the city. At present it constitutes one of the best markets in the State for power and industrial machinery, as will have been noted by the constant references made to Sheboygan in this report.

A plant for the production of a furniture specialty is being established at Racine, Wis., by the Racine Stool Mfg. Company. Shops have been secured and equipment sufficient for present requirements will be provided shortly, but considerably more is likely to be needed before fall. The concern expects to employ 500 men when operating to the full capacity contemplated.

Among Wisconsin manufacturers who will have exhibits at the Milwaukee Automobile Show to be held this month are the Harley-Davidson Motor Company, Wisconsin Motorcycle Company, Sternberg Mfg. Company, Brodesser Auto-Truck Company, Wisconsin Motor Mfg. Company, A. J. Monday, Northwestern Storage Battery Company, Kiselkar Company, Charles Abresch Company, Meiselbach Mfg. Company, Wallman Mfg. Company, Wold Bros., Garage Equipment Company and the Milwaukee Trimming Company. Nearly all of these will be buyers of machine equipment during the present year, as they are either making or planning extensions to their production facilities, and there will be some notable plant enlargements. This is a trade worth following up, but more can be done by gradual approaches than by any sudden onslaught.

The Duplex Coil Company, Fond du Lac, Wis., has installed new machinery, including drills, grinders, screw machines, &c., and is starting to manufacture magnetos for motor vehicles.

The El Starr Mfg. Company, Milwaukee, will be in the market shortly for some new equipment, including one or more heavy motors for driving machinery.

Among the timber and working plants of the State which have provided for new machinery are the Rib Lake Lumber Company, Rib Lake, Wis.; the Kurz-Downey Company, Bayfield, Wis., and the Western Banana Crate Company, recently organized by C. H. Gordon at La Crosse, Wis.

Two new machines will be required by the Northern Paper Mills, Green Bay, Wis., for an addition to the plant, together with auxiliary apparatus. Power equipment, consisting of boilers, engines, electric generators, motors, &c., will also be installed. For details address the mill engineers, O'Keefe & Orbison, Appleton, Wis.

New boilers will probably be purchased for the municipal plant at Clintonville, Wis., as the City Council has under consideration plans for increasing its capacity. It is also proposed to operate a heating system in the business district with steam from this plant.

A contract is to be let shortly by the city of Marinette, Wis., for constructing steel bridges over the Menominee River at Riverside avenue and at Stanton street.

Information from a source ordinarily found authentic is to the effect that the Kimberley-Clark Company, Appleton, Wis., will erect one of the largest industrial plants in the Northwest, on the site of the old Vulcan mill, for the manufacture of paper. If this is correct it will mean the purchase of a large quantity of driving, operating and conveying machinery, as well as a full equipment of tools for the repairs continually needed in connection with such a plant. Power will undoubtedly be obtained from a central station.

In addition to the engine, generator, &c., recently referred to, the Reiss Coal Company, Sheboygan, Wis., requires elevating, conveying and other machinery for handling cargoes and transferring fuel to cars.

The Maynard Steel Foundry Company, Milwaukee, is largely engaged at present in the production of crucible steel castings for automobile parts. During the year there is likely to be some extension of the facilities of the plant.

Dr. T. S. Pritchard, Manitowoc, Wis., is reported to be organizing a company which will build a hydro-electric plant in that vicinity for the purpose of furnishing power to industries in the city, including the various metal working establishments.

The Milwaukee Boiler Company has taken contract for a steam boiler plant of 300 hp. to be installed in the new factory of the Kalt-Zimmers Mfg. Company, Milwaukee.

An effort to secure new industries for Superior, Wis., is now being made by the Commercial Club of that place. Several automobile manufacturers are reported to be considering sites along the new Interstate Transfer Railroad, which will form a belt line connecting the manufacturing establishments, shipping, &c., of both Superior and Duluth.

Otto C. Nehling and others of Milwaukee have organized the Milwaukee Ice Machine Company to establish a plant for the manufacture of refrigerating apparatus. A large trade in this line is being enjoyed here at present by the Vilter Mfg. Company, which also builds the engines for driving large machines.

Wisconsin products will be represented in the automobile show to be held at Brussels, Belgium, the Mitchell-Lewis Motor Company having shipped several of its machines for exhibition there.

From Whitehall, Wis., it is reported that the Whitehall Mill & Power Company, recently organized there, will install an electric generating unit for power and lighting.

Saws, barkers, grinders, conveyors, metal frame digesters, electric motors and operating machinery of various kinds will be required for the new sulphite mill to be erected by the Wausau Paper Mills Company, Wausau, Wis., at Brook Station. The main building will be of steel construction. Some of the equipment from an existing plant will probably be utilized.

At the Electrical Show in Chicago the Milwaukee Vacuum Machinery Company has had on exhibition a portable device for cleaning the equipment in power and industrial plants, also one of a heavier type for railroad work. The demand for apparatus of this class is rapidly increasing. Three other companies here manufacture motor and belt driven compressors used for the same purpose, except that the operation is a blowing instead of a vacuum process.

The Wisconsin Bridge & Iron Company, Milwaukee, has taken contract for the structural iron and steel work on the new pumping station at Detroit, Mich.

The Frost Mfg. Company, Kenosha, Wis., is planning to install an electric generating unit of 150 to 200 kw. The prime mover will be either a Corliss engine or an internal combustion engine operating on producer gas, and information concerning comparative costs of installation and operation is now being sought. The company also intends to purchase a line of motors, probably direct current, for driving machinery used in the manufacture of brass specialties.

Hydraulic turbines and generators to furnish about 2000 hp. for operating its new plant will be required by the Marathon Paper Mills Company, Wausau, Wis. Considerable auxiliary apparatus is also needed. A part of the equipment has recently been contracted for.

The Lyons Boiler Works, De Pere, Wis., is putting on the market a new type of safety boiler of which over 200,000 hp. have been installed. It is selling to particular advantage on the Pacific Coast and in the Orient. The growth of this industry has been uncommonly rapid.

The Upham Mfg. Company of Marshfield, Wis., is reported to have decided upon plans for a power plant of 300

kw. or over, which will be built on the Black River at Neillsville, Wis. One or more impulse turbines, operating under a low and variable head, will drive alternating current generators. The details, however, have not yet been fully worked out.

As forecasted in this report two weeks ago, the Keelyn Electric Company and Downey & Kruse Company, Milwaukee, will build a new plant or plants of their own to replace the quarters destroyed by fire, which were leased. Information as to construction plans and equipment can be obtained in due course by writing directly to the Keelyn Company.

Some additional machinery, including probably power apparatus, will be installed shortly by the National Box & Binding Company, Sheboygan, Wis., which is preparing to considerably extend its facilities.

Cutting, planing and polishing machines for a modern stone working plant, as well as power and compressed air equipment, will be required for new shops, 160 x 200 ft., to be erected by the Green Bay, Wis., Monumental Works.

It is reported on good authority that automatic stokers will be provided this year for the boiler room of the water works at Waukesha, Wis. An additional pumping unit may also be installed later.

A Symons crusher manufactured by the T. L. Smith Company, Milwaukee, has been sold to the Gold Ray Granite Company, Medford, Ore.

A factory equipped with the most modern machinery will be built at La Crosse, Wis., by the Western Brick Machine Company, if plans now under way are consummated.

The Krantz Mfg. Company has been established at Pt. Washington, Wis., to manufacture a small iron household specialty. The castings are being made by a neighboring foundry and the apparatus assembled in leased quarters, but a complete plant will probably be erected in the course of the next few months.

E. F. La Fayette, Mt. Vernon, Wis., has been awarded contract for building two steel bridges near Skiyou, Wash.

New England Machinery Market.

BOSTON, MASS., February 1, 1910.

While the machine tool builders are making no complaint as to their sales, which are running about even with the recent market, in some allied lines disappointment is manifested. The woodworking machinery people are not quite so busy as they were a month ago. The recent strikes in the marble, granite and slate quarries of Vermont have had a noticeable effect on the business of the dealers who supply them with machinery, including hoisting equipment. In fact, the market for this latter class of machinery is slow in all directions, buyers continuing to show some hesitation. However, such instances are the exception rather than the rule, most lines being prosperous, with perhaps a slight degree of average falling off, which may be termed seasonable. The larger users of machine tools are steadily in the market. The General Electric Company is getting together the equipment for new buildings under construction, and the textile machinery and shoe machinery trades are in the market as occasional buyers. The shops which are building the shoe machinery for the new Plant factory, which will be equipped entirely with machinery independent of the United Shoe Machinery Company, are rushing at full pressure. In addition to the works of the Bresnahan Shoe Machinery Company, Lynn Mass., the ship repair works of the Lockwood Machine Company, East Boston, and shops of the Fore River Shipbuilding Company, Quincy, Mass., are assisting in the task.

An announcement of much importance to the trade is of the appointment of H. A. Fabian as manager of the department of purchase and supplies for both the New York, New Haven & Hartford and the Boston & Maine railroads, with offices at the South Station, Boston. The scope of his buying will be very broad, including all purchases for the New York, New Haven & Hartford, Central New England, New England Navigation Company, which operates a large fleet of coastwise steamers; the Connecticut Trolley Company, the Rhode Island Trolley Company, the New York & Stamford Railway, and the Housatonic Company, all New Haven properties, and the Boston & Maine, Maine Central, Washington County Railroad and the Somerset Railroad. The action is the most important step toward centralization of buying power which has been taken in this territory. Mr. Fabian has been the assistant to President Mellen.

The Hendee Mfg. Company, Springfield, Mass., manufacturer of motor cycles, is planning to add 150 per cent. to its manufacturing space by the erection of an addition about 40 x 150 ft., five stories and basement, which will practically duplicate the present building in ground dimensions, but with two additional floors. To carry out the new plans the company has reorganized with capital stock of \$2,600,000, and subscriptions already made guarantee the

carrying out of the expansion. The company is producing 7500 machines for the 1910 market. George M. Hendee remains at the head of the business as president and general manager; Oscar Hedstrom, the mechanical engineer of the company is the vice-president, while Frank J. Weschler, for four years sales manager, is the secretary and treasurer of the new corporation. The company will undoubtedly be a large buyer of machine tools and other equipment in connection with the enlargements.

The M. S. Wright Company, Worcester, Mass., manufacturer of piano player hardware and vacuum cleaners, is to occupy 30,000 sq. ft. of floor space in the building at Jackson and Beacon streets, the change to be made immediately. The company is buying some machinery and will be in the market for additional tools later.

The Bliven Mfg. Company, Putnam, Conn., has been organized to manufacture the Bliven trolley harp. For the present the work will be done by outside parties. Percy C. Bliven, Danielson, Conn., is at the head of the project.

It is reported at Hartford, Conn., that the Columbia Motor Company of that city may be taken into the great automobile combination headed by the Maxwell-Briscoe Motor Car Company, Tarrytown, N. Y. No official confirmation of the report has been received.

Henry P. Curtis, Boston, has been made ancillary receiver of the Chapman Ball Bearing Company of that city, in proceedings originating in Buffalo, N. Y., where Joseph P. Schattner has been appointed receiver by the United States Court, on the petition of creditors.

The receiver of the Leeds & Catlin Company, Middletown, Conn., manufacturer of phonographic records, will sell the property and equipment at auction, February 12.

The directors of the Norton Company, Worcester, Mass., manufacturer of alundum products, have voted to capitalize the large surplus, increasing the amount of stock from \$408,000 to \$816,000. The action carries with it no special significance as to future plans.

Industrial projects outside of the metal trades include the following: Joseph Caunt & Co., Lynn, Mass., six-story shoe factory at Cambridge, Mass., to have 60,000 sq. ft. of floor area; Army & Navy Duck Company, Wilkesonville, Mass., to remodel old building into a weave shed 40 x 110 ft.; Rumford Falls Power Company, Rumford Falls, Maine, penstock 14 ft. in diameter, 1050 ft. long, to cost \$60,000, to develop 7000 hp. for a project not yet announced; Penrhyn Slate Company, Middle Granville, N. Y., slate mill, 84 x 100 ft., at Hydeville, Vt.; Seekonk Lace Company, Pawtucket, R. I., main building 100 x 100 ft., one story, finishing department 50 x 90 ft., two stories, boiler house 30 x 40 ft.; new project headed by William Whitman, to establish large textile mills on site just purchased at New Bedford, Mass.; Kupfer Bros., New York, addition to Riverdale Mills, Northbridge, Mass., 85 x 187 ft., two stories, the property to be used for paper manufacturing; Circular Loom Products Company, Boston, conduits and coverings for cables, factory at Chelsea, 90 x 120 ft., two stories and basement; Sheffield Dentifrice Company, New London, Conn., building 60 x 120 ft., two stories; Windham Mfg. Company, Willimantic, Conn., addition 35 x 70 ft., four stories.

The Boston & Northern Street Railway Company will reconstruct its power plant at Lawrence, Mass., including the installation of new boilers and a 1200-hp. generator set.

The Connecticut River Company has declined to accept the proposition of the Northern Securities Company for the purchase of the former's power properties at Windsor Locks, Conn., with the idea of largely increasing the hydraulic power development of that section of the Connecticut River and providing for the construction of locks which would make the stream navigable for mercantile purposes.

The S. A. Woods Machine Company, Boston, Mass., has brought out a new planer for car shops and planing mills, having as a characteristic feature a single belt drive, operating both cutter heads, which is made possible by a new flexible coupling.

Plans are being made for a new manual training school at Rockville, Conn., a project made possible by a bequest of \$100,000, together with large additional subscriptions. The institution will be known as the Sykes Manual Training School, for its founder, the late George Sykes.

The Magnesite Asbestos Company, New York and Boston, is financing an increase in capital stock, from the proceeds of which it is proposed to enlarge the works at Boston and Newark, N. J. The company manufactures magnesium products, including steam pipe and boiler covering, and asbestos materials.

The Exeter Machine Works, Exeter, N. H., has reorganized under its new ownership, with Joseph H. Symonds, president; Arnold W. Heath, secretary; Frank H. Burtt, treasurer, and William Burlington as a director. The company will continue the manufacture of steam and hot water heating apparatus, boilers, steam engines, blowers and exhausters, and will also make the Hughes combination axle box and the Hughes anti-friction oils and greases, lubricants for engines and automobiles, axle boxes, pulleys and shafting. The foundry, which has been closed two years, will be reopened.

Miscellaneous Machinery and Power Equipment.

James Lynch, Kansas City, Mo., has organized the Lynch Railway Automatic Brake Company, to establish a plant for the manufacture of a new type of patented brake. Details of structure or equipment have not yet been announced.

A mechanical filtration plant will be built this spring at Takoma Park, D. C.

Power and concentrating machinery is to be provided some time this year for a new ore reduction plant to be built by the Overlook Mining Company, Atlanta, Idaho.

The Thomas Duncan Electric & Mfg. Company, La Fayette, Ind., will build a new plant. The specifications covering equipment have not yet been fully decided upon.

The Pittsburgh-Buffalo Company, Pittsburgh, Pa., has arranged for the installation of a number of heavy motors in connection with coal handling machinery.

The Helvetia Copper Mining & Smelting Company, of which C. C. Prindle, Minneapolis, is president, contemplates the purchase of some equipment, including an electric power plant.

A compound or triple expansion pumping engine of 10,000,000 to 15,000,000 gal. capacity will probably be purchased this year at Sacramento, Cal., to replace equipment which shows poor operating economy.

An addition 110 x 160 ft. will be built to the woodworking plant of the Adams & Kelly Company, Omaha, Neb., necessitating a large quantity of new motor driven machinery.

G. A. Northcutt, Huntington, W. Va., is interested in the construction of a new public service plant in an adjacent city for which electric power and pumping equipment will be required.

A municipal power and lighting plant, with engine driven dynamo, will probably be built during the coming summer at Mt. Vernon, Ky.

Owing to the necessity for a largely increased output, one or more new prime movers and generators will in all likelihood be provided before fall for the Smithville, Mo., Electric Light Company, and the entire plant may be reconstructed.

The city officials of Kirkwood, Ga., are planning the erection of a pumping plant some time this year.

A power plant of 2000 hp. is to be built by the Firestone Tire & Rubber Company, Akron, Ohio, in connection with a new factory, for which plans are now being drawn. Requirements will include boilers, Corliss engines, continuous current dynamos, motors, lifting and conveying apparatus and special machinery.

Crushing machinery, including a 40-stamp battery, with power equipment, will be provided this year by C. A. Wing, Wallace, Idaho, for his Oro Monarch Mine.

Bids will be taken shortly on machinery for a water works system at Waxahachie, Texas. A bond issue is now being provided.

An electric power plant and some new operating machinery will be purchased shortly for the Ruth Pierce Mining Company, Harnitos, near Merced, Cal.

From Bradley, Cal., it is reported that a new pumping plant may be built there this spring.

The projected municipal improvements at Marianna, Fla., have been authorized. New equipment for the electric power and pumping station will be bought within the month.

The city of Krebs, Okla., has provided funds for building a modern high duty pumping station. Purchase of equipment will be made shortly.

A new factory, probably equipped with electric power, will be built at Grandledge, Mich., by the Trask Knitting Company of Williamston, Mich.

Machinery for the new pumping plant at Milford, Iowa, will be purchased about March 10.

New boilers, Corliss engines and other machinery is being installed in the plant of the Manley-Moore Company, South Prairie, Wash. Additional apparatus will be required the latter part of the year.

A new hoisting engine will be provided this season for the plant of the Laurel Mining Company, Winnemucca, Nev.

The project for municipal water works at Havelock, Neb., has reached the stage where bids on machinery will be taken shortly.

The Turners Falls Company, which supplies electric current for use in various industries at Turners Falls, Mass., will duplicate equipment now in service by installing a 1000-kw. alternating current generator and hydraulic turbine, together with subsidiary apparatus.

A small electric power plant, which will be enlarged later, is being added to the equipment of the Gamble Lumber Company, Brewster, Wash.

Funds have been provided for a pumping station and water supply system at Cuero, Texas. Machinery will be purchased about March 1.

It is reported from Paris, Ky., that an engine and dynamo will be bought this winter for the plant of the Paris Electric Light Company.

Additional boilers and an electric generating unit of about 500 hp. will be installed within a few months in the municipal station at Elgin, Ill., which now contains only pumping machinery.

Burpee & Letson, Bellingham, Wash., are putting on the market a four-cycle, heavy duty gasoline engine, which has met with a very successful sale in the Pacific Northwest, and their facilities for its manufacture will be extended.

Plans for water works at Prosser, Wash., will probably be decided upon by the municipal authorities within the coming month.

B. A. Johnson, Miles City, Mont., is reported to be planning the construction of a foundry for the manufacture of brake shoes. Detailed specifications, however, have not been drawn.

The hydroelectric plant of the Hanford Power & Irrigation Company at Priest Rapids, Wash., will be doubled in capacity. The present equipment is sufficient, however, to supply this year's needs.

Some additional machinery for operating its lines will probably be purchased before fall by the Muscatine, Iowa, North & South Railway, including two new boilers and an engine driven dynamo or turbine unit.

Some additional shop machinery, particularly woodworking tools, will be provided shortly for the De Foe Boat & Motor Works, Bay City, Mich.

A large cutting and finishing plant, with power driven saws, planers, grinders, motors, air compressors, boiler, engine, dynamo, motors, &c., will be built by the Washington Marble Company, at Colville, Wash.

The Dundee Hydraulic Power Company, Dundee, Mich., is planning construction of a large electric generating plant. The details, however, have not yet been worked out.

A municipal pumping station may be built this year at Newman, Ill.

W. F. Barnes is establishing a box factory at Klamath Falls, Ore. Machinery sufficient for present requirements has been purchased, but more will be needed later.

Pumping machinery will be bought about March 1 for a water works system at Dayton, N. M.

A. C. Kuball, Cincinnati, Ohio, is in the market for pump, blowers, &c., for a new building which he is planning.

Some new ore reduction machinery will be required this spring by the Minerva Mining Company, Atlanta, Idaho.

A tubular boiler, engine and ice machine are required by the Krey Packing Company, St. Louis, Mo.

Plans for a power plant, possibly to be equipped with gas engines and generators, are under consideration by the Central Kansas Interurban Railway Company, Newton, Kan., work on whose new system will commence in about two months.

A factory 60 x 100 ft., with electrically operated tools, will probably be built in the near future at Kalamazoo, Mich., by the American Sign Company.

Machinery, including possibly a new Corliss engine, will be required this coming summer for a new timber plant to be erected by Dunnaham & Robinson, Boyce, La.

John Rutherford, Muncie, Ind., is having plans drawn for a factory in which to produce gas and electric fixtures. Some light machine tools will be needed and probably electric motors, but the equipment details have not yet been decided upon.

A steel bridge 400 ft. long, with approaches, will be provided by the Irwin-Herminie Traction Company, Hahns town, Pa., about midway of its line.

A large new factory, with power and operating machinery, is to be built in the spring by the Muncie, Ind., Glass Mfg. Company.

Electric hoisting, conveying and loading machinery will be provided by the Anacortes, Wash., Lumber & Box Company for a 725-ft. dock about to be constructed.

The installation of pumping machinery for supplying water to the municipality is under consideration at Chester, Ohio.

Some additional equipment will be provided shortly for the city electric plant of Ashtabula, Ohio, which is being enlarged.

A 60-hp. hoist, with gasoline engine, will be installed at the plant of the Austin-Manhattan Mining Company, Austin, Nev., by the F. C. Richmond Machinery Company, Salt Lake City, Utah.

A gas engine driven pumping plant will be constructed at Petersburg, Neb., and bids on machinery are to be taken in the near future.

Foundry, machine shops, boiler shop and a large steel viaduct will be built at Tacoma, Wash., by the Oregon & Washington Railroad.

Some new electric generating machinery may be provided by fall for the central service station of the Franklin, Ind., Water, Light & Power Company. The proposed improvements have not yet been fully decided upon.

Woodworking machinery will probably be needed shortly by J. W. Willis Company, Washington, Ohio, for a new plant to replace one recently destroyed by fire.

Pumping units with a capacity of 50,000,000 gal. daily are to be provided by Kilbourne & Clark, Seattle, Wash., for

a large irrigation system near Wahlake, Wash. The machinery will be driven by very powerful alternating current electric motors.

New equipment will be provided shortly for a large addition to be made to the factory of the Bass Furniture Company, Evansville, Ind.

Bids will be taken in the near future for machinery to be installed in the new municipal water works at Burlington, Iowa. Construction of the pumping station will begin in about six weeks.

Plans for a hydroelectric plant of 3000 hp. or over, on the Cedar River, have been made by the Iowa Traction Company of Cedar Rapids, Iowa. The power house will be at Vinton, Iowa.

A boiler plant, engine, dynamo and other machinery will be required shortly by Chas. Wessmath & Sons, St. Louis, Mo., for a new plant.

The Wilmont Machinery Company, New Orleans, La., has acquired a much better location at 217 South Peters street.

The Canadian Niagara Power Company will build a power distributing station at Bridgeburg, Ont., opposite Buffalo, N. Y. The plant will cost \$60,000, and will be equipped with transformers, distributing circuit, switches, &c. P. P. Barton, manager, Niagara Falls, Ont.

The Electrical Department of the city of Toronto, Ont., is receiving bids for 8000 kw. of 13,200-volt transformers. G. R. Geary, chairman Board of Control.

Fuller & Coult, consulting engineers, Chemical Building, St. Louis, Mo., are preparing plans for an electric light plant to be constructed by Chillicothe, Mo., at a cost of \$50,000. Bids will be received about March 1.

The Freyer Trunk Mfg. Company, Houston, Texas, will add a 25 x 100 ft. three-story addition to its factory, in which considerable new equipment will probably be required.

The Fisk University, Nashville, Tenn., H. H. Wright, Dean, has made up plans for a central heating and lighting plant, the estimated cost of the plant being \$50,000.

The National Novelty & Mfg. Company has been incorporated at Terre Haute, Ind., with \$10,000 capital stock to manufacture novelties in brass, iron and other metal, also in wood. The directors are S. Barret, Jr., John Eskine and John H. Gorgen.

The Electrical Pressed Steel Company, Dayton, Ohio, has purchased a site for a factory at Redkey, Ind. The company will supply the town with electric lights.

The Henderson County Bridge Company has been consolidated with the Vanderburg Bridge Company of Evansville, Ind., under the name of the Evansville Bridge Company, which has been incorporated with \$15,000 capital stock to build a bridge across the Ohio River. The incorporators are William H. McCurdy, Louis A. Daus and Curtis H. Battin.

The John A. Rowe Cut Stone Company has been incorporated at Bedford, Ind., with \$75,000 capital stock, to quarry and manufacture stone. The directors are John A. Rowe, Winton W. Hanner and John M. Owens.

The citizens of Glenwood Springs, Colo., have voted bonds in the sum of \$125,000 for a water works system.

The McCall Incinerator Company, headed by Dr. J. H. McCall, the inventor and patentee, from Huntingdon, Tenn., has been incorporated with a capital stock of \$500,000, mostly subscribed as a Nashville, Tenn., enterprise, though for the present the office is maintained at Huntingdon, Tenn., where the inventor lives. The other incorporators are: A. M. Tillman, J. C. R. McCall, Guilford Dudley and W. E. Nelson. It is proposed to erect a foundry in Nashville. The McCall incinerator has become widely known as a sanitary invention, and having been indorsed and adopted by the United States Government for its numerous military camps and on the Panama Canal. Dr. Jas. H. McCall, the inventor, conceived the idea when a surgeon in the United States army in the Philippines. It is proposed to manufacture for hospitals, municipalities, &c.

The Fowler Mfg. Company at Alexandria, Ind., has progressed with the installation of machinery and equipment far enough to make it probable that the new factory will be in operation about the middle of February. Its chief product will be a stamp vending machine, which sells stamps from rolls. The company also has models completed for a gasoline motor car for use on railroads.

The Mais Motor Truck Company has been incorporated at Peru, Ind., with \$300,000 capital stock. The directors are A. F. Mais, M. G. Cochran, E. W. Spencer, A. W. Markham and W. A. Wood.

The Sprang Clay Products Company has been organized and incorporated at Fort Wayne, Ind., with \$30,000 capital stock, as manufacturers. The directors are M. J. Sprang, M. I. Gorrell, Jr., R. S. Bradshaw, William Geake, and others.

The More-Jones Brass & Metal Company, St. Louis, Mo., is in the market for power equipment for a new factory, including steam generating plant of 150 hp.

A large addition, said to be intended for the manufacture of automobiles, will be made to the works of the Carriage Wood Stock Company, Owensboro, Ky. Equipment details have not been given out.

A large hoist, together with mining machinery, will be purchased shortly for the property of the Square Deal Mining Company, Prescott, Ariz.

A gyratory crushing plant of 200 tons hourly capacity is to be provided for the works of the Nova Scotia Steel & Coal Company, Ltd., New Glasgow, N. S.

The Redondo plant of the Pacific Light & Power Company, which consists of steam driven units, will be doubled in capacity. This station is remarkable as the first in which crude petroleum has been used as fuel under the boilers on so large a scale, and with very satisfactory results. Additional hydroelectric units are also to be installed later at the Kern River plants of this company.

The Boston-Colorado Power Company, Rowena, Colo., is preparing plans for a hydroelectric plant of 5000 hp., to be located near Boulder, Colo.

The city of Rochester, N. H., may build its own electric power plant. Plans are now under consideration.

Construction of a hydroelectric plant of 150 hp. will be undertaken this summer by E. L. Robinson of Buckley, Wash.

A Corliss engine and generator, hoisting engine and coal handling machinery will be required in about six months for a plant to be erected at West Mansfield, Mass., by the Massachusetts Coal & Power Company, Boston, Mass. The details of the power equipment have not yet, however, been fully determined upon.

The Utah Ice & Storage Company, Salt Lake City, Utah, which now operates three ice making machines having a total refrigeration capacity of 275 tons per day and an ice capacity of 90 tons per day is preparing to make extensive improvements. The company has let the contract for a new plant which will be erected on a site south of its present works. The new plant will contain two York compressors with a daily capacity of 150 tons refrigeration or a combined ice making capacity of 150 tons. The power plant will be equipped with four 150 hp. boilers. The purchasing of all machinery and equipment to be installed in the new plant will be handled through the office of the company at Colorado Springs, Colo., but it is understood that the contract has been closed with the York Mfg. Company.

The Aermotion Company of America, main office 1611 Wright Building, St. Louis, Mo., has filed articles of incorporation with a nominal capital of \$2000. The company will handle the Gnome rotary motor which is built near Paris by the Societe Des Moteurs Gnome and was designed by Laurent Seguin, and is now used by many leading foreign aviators.

A Corliss engine is required by J. J. Carter, Wood River, Neb., for the new mill which he proposes to build.

Electric motor drive will be used in a new factory to be built by the Brown Lumber Company, which succeeds the Traverse City Mfg. Company, Traverse City, Mich.

Construction of a municipal water works system is being planned by the city officials at Issaquah, Wash.

Some additional equipment, including tubular boiler, will be provided this month for the power plant of the Sand Mountain Electric Company, Albertville, Ala.

A four-valve Corliss or automatic engine to deliver 100 to 150 hp. will probably be purchased in the near future by the Myers Electric Light Company, Columbia, Ky.

The Phoenix Lake Mining Company, Tuolumne, Cal., will install crushing machinery, the initial equipment to consist of five stamps and a similar battery to be added later.

A hoisting engine of large capacity will be installed next summer on the Johnson Mining Company's property near Bisbee, Ariz.

A mechanical filtration plant, with the most modern pressure machinery, has been recommended by the water commissioners for installation at Lynn, Mass. If approved, the equipment will be purchased this spring.

Frank L. Forlow, Webb City, Mo., is planning the construction of a smelting plant.

A large increase in the capacity of its generating station is contemplated by the Ozark, Mo., Water Power & Light Company, and new machinery may be purchased in April.

The city officials of Eufaula, Ala., are considering plans for the installation of an electric power and lighting plant.

New power and cutting machinery may be required in the near future for a plant to be built at Canton, Ohio, by the Stark Lumber Company to replace one that burned.

The Bridgeport Electric & Railway Company, Bridgeport, Ala., is about to take bids on a 350-hp. boiler plant, engine, 200-kw. dynamo, exciter, switchboard and other apparatus for a complete power station. Specifications are now being drawn.

An electric power and pumping plant operated by hydraulic turbines will be constructed at Booneville, Ark., by the Booneville Light & Water Company.

The McAfee Mfg. Company, Garnett, Kan., will enlarge and considerably improve the equipment of its electric power plant.

The Whiteville Light & Power Company recently organized at Whiteville, N. C., is having plans drawn for an electric generating station.

The M. R. Smith Company, Mineral, Wash., will install

a new boiler and other equipment, which has already been purchased.

Power and woodworking machinery is required by M. E. Kenfield, Cass Lake, Minn., for a new plant.

H. O. Barncord, Midland, W. Va., will be in the market before long for an electric generator and other machinery to be installed in a new power plant at Moorefield, W. Va. A company is being organized to operate it under a public service franchise recently obtained.

It is probable that new pumping machinery will be installed this year in the water works at Ardmore, Okla.

A new alternating current generator will be purchased shortly by the Toccoa Falls Light & Power Company, Toccoa, Ga.

J. M. Brown, Moscow, Idaho, will build a factory for the manufacture of a patented metal specialty.

A small pumping unit will probably be needed this spring by the Hardwood Mfg. Company, Minneapolis, Minn.

From Omaha, Neb., it is reported that the Union Pacific Railroad Company will build a large addition to its machine shops there.

A new factory, with modern machine equipment, will be erected some time this year by the Reddinger Carving Works, Evansville, Ind.

A steam turbine power plant of about 500 hp. initial capacity, or larger, will probably be provided this summer by the Easthampton, Mass., Gas Company.

Boilers, engine, condenser, pumps, dynamos, switchboard, &c., will be required shortly for a new electric plant to be erected by the Progressive Light & Power Company, Decatur, Ill.

Plans for a hydroelectric plant of 6000 hp. on the Spokane River have been made by the Big Bend Water Power Company, Spokane, Wash., and construction work will begin in the near future.

The Dakota Portland Cement Company, Sioux Falls, S. D., recently mentioned, has decided upon a large power plant, and steam turbines may be used as prime movers, with alternating current motors for driving the machinery. The mills will be located on the Missouri River in the vicinity of Chamberlain, S. D.

Equipment for iron and coal mining and handling will be required within the year by the Jack River Mining Company, which G. H. and F. L. Miller have organized at Chattanooga, Tenn. A large tract in Polk County will be developed.

A new pumping unit of moderate capacity will be installed this season for municipal service at Gilbert, Minn., if present plans are adopted.

Equipment will probably be purchased this month by the Ireland & Matthews Mfg. Company, Detroit, Mich., for a factory addition, specifications for which are now being drawn.

John E. Cox, Van Horn, Texas, may be in the market this spring for a Corliss engine and electric generator.

An electric generating unit for municipal service will probably be purchased in April by the authorities at Fairview, Kan.

The Dominion Motors, Ltd., Windsor, Ont., expects to erect a factory for the manufacture of automobiles in Windsor or Walkerville, Ont., also a subsidiary plant in the Northwest, the location for which has not yet been decided upon. This company was erroneously referred to in *The Iron Age* of January 20 as the Dominion Motors Car Company of Detroit, Mich. It has no office at that place.

The Middletown Car Company, Middletown, Pa., Arthur King, president, will erect a car factory that will employ about 1200 men. Part of the necessary equipment has been ordered.

The Republic Iron & Steel Company, Pittsburgh, has an inquiry out for the following equipment to be installed in its Youngstown open hearth steel plant: One 125-ton electric ladle crane, one 75-ton ladle crane, one 50-ft. stripper crane, one 50-ft. ingot crane and two charging cranes.

A. C. Hoefinghoff, recently sales manager for the Heald Machine Company, Worcester, Mass., and George C. Kimmel, who has been designer for that company for several years, are organizing the Cincinnati Grinder Company, which will be located at Cincinnati. No announcement has been made of the type of grinder which will be built.

It is announced from Toledo, Ohio, that the F. Bissell Company of that city will build a machine shop in the spring to manufacture switchboards and other products. The company has just acquired a site 350 x 630 ft. on which it will at once begin the erection of a large warehouse.

Correction.—In the illustrated description of the Massachusetts squirrel cage fan given in *The Iron Age* January 27, 1910, the address of the Massachusetts Fan Company, by typographical error, was given as Waterbury, Mass.; it should have been Watertown, Mass.

Government Purchases.

WASHINGTON, D. C., February 1, 1910.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids February 21 for the following machinery and tools:

Schedule 2220, one engine lathe; schedule 2219, three air compressor outfits; 2221, two oil pumps.

The following bids were opened by the Isthmian Canal Commission, Washington, January 24:

Class 5.—Two pulsometer pumps, 425 gal. capacity, and four pulsometer pumps, 700 gal. capacity—Bidder 7, Fox Brothers & Co., New York, \$2619.74; 12, Manning, Maxwell & Moore, New York, \$2671.19; 14, Motley, Green & Co., New York, \$2717.17; 15, National Electrical Supply Company, Washington, \$2610.03; 16, Nye Steam Pump & Machinery Company, Chicago, Ill., \$1570; 17, Pulsometer Steam Pump Company, New York, \$2684.05; 21, Tucker Tool & Machine Company, New York, \$2512.31; 23, Vermilye & Power, New York, \$2848.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids for the following machinery January 25:

Class 21.—Three Westinghouse standard steam driven air compressors—Bidder 92, Gardner Governor Company, Quincy, Ill., \$535; 102, Hollidge Machinery Company, Seattle, Wash., \$175.

Class 24.—Eight marine water tube boilers and spare parts—Bidder 19, Babcock & Wilcox Company, New York, \$14,125; 255, Mosher Water Tube Boiler Company, New York, \$9157.

Class 51.—One engine lathe—Bidder 8, Auman Machinery & Supply Company, Baltimore, Md., \$867; 76, Frevort Machinery Company, New York, \$688; 82, Fairbanks Company, New York, \$675; 95, Garvin Machine Company, New York, \$765 and \$920; 132, Lodge & Shipley Machine Tool Company, Cincinnati, Ohio, \$871; 139, Manning, Maxwell & Moore, New York, \$810 and \$880; 155, Niles-Bement-Pond Company, New York, \$835; 214, Springfield Machine Tool Company, Springfield, Ohio, \$678.

Class 52.—One extension gas engine lathe—Bidder 76, Frevort Machinery Company, New York, \$2124; 82, Fairbanks Company, New York, \$1960; 139, Manning, Maxwell & Moore, New York, \$2005.

Class 53.—One high duty heavy radial drill—Bidder 8, Auman Machinery & Supply Company, Baltimore, Md., \$1074 and \$1095; 48, Cincinnati Blackford Tool Company, Cincinnati, Ohio, \$1055; 76, Frevort Machinery Company, New York, \$1035; 82, Fairbanks Company, New York, \$1050; 95, Garvin Machine Company, New York, \$870 and \$925; 139, Manning, Maxwell & Moore, New York, \$1025; 155, Niles-Bement-Pond Company, New York, \$1050 and \$1633.

The Isthmian Canal Commission's circular No. 558 calls for bids, to be opened February 28, on several pumps, steam traps and machinery supplies.

The Howard Iron & Tool Company's Property for Sale.—Owing to the death of William R. Jenkins, treasurer and manager, the property and franchises of the Howard Iron & Tool Company are offered for sale, in order to settle the estate, on favorable terms and at a price claimed to be less than half the actual value. The property is located one mile distant from Howard, Centre County, Pa., and is on the line of the Bald Eagle Valley Railroad, a branch of the Pennsylvania Railroad. It consists of 14 acres of land on which are erected a rolling mill having one 12-in. train, one 8-in. train and a slitting machine for slitting old steel rails; an implement factory, driven by water power and equipped with heating furnace; two large presses, one smaller press, one large combined punch and shear, and various other tools and appliances, also one 2500-lb. steam hammer and two helve hammers of superior type, and a machine shop containing lathe, planer, milling machine and other tools suitable for fitting up dies and making repairs.

The Bristol Brass Company.—At the annual meeting of the Bristol Brass Company, Bristol, Conn., Julian R. Holley was made president as well as treasurer and general manager, and the new office of assistant general manager was created for Alexander Harper, for five years manager of the company's Chicago office. The Board of Directors was increased by the election of Albert F. Rockwell and William S. Ingraham. The other directors are: Henry F. English and Dean Welch, New Haven, Conn.; Julian R. Holley, George W. Mitchell, Samuel B. Harper, Roger S. Newell, Charles T. Treadway, all of Bristol, and Charles W. Gross of Hartford, Conn.; Henry F. English was elected vice-president, and Samuel B. Harper secretary and assistant treasurer.

The Rockford Lathe & Drill Company, Rockford, Ill., has increased its capital stock from \$20,000 to \$50,000.

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The International Asbestos Association.

The International Asbestos Association was recently organized at a meeting held in New York. Its membership is composed of representatives of American and Canadian mine owners and manufacturers. The interests at the meeting represented between 80 and 90 per cent. of the asbestos business in the United States and Canada. Included in the association are the largest producers and users of asbestos in the United States and Canada, among them being the Amalgamated Asbestos Corporation, Ltd., Keasbey & Mattison Company, Philip Carey Mfg. Company, Asbestos Protected Metal Company, Franklin Mfg. Company, H. W. Johns-Manville Company, Sall Mt. Asbestos Mfg. Company, Ling Asbestos Company and the United States Asbestos Company. The aggregate capitalization of the concerns who are so far represented is over \$40,000,000. The following were elected officers of the association: T. F. Manville, president; R. V. Mattison, Jr., vice-president; R. P. Doucet, secretary.

It is announced that the purposes of the association are the general exploitation of the uses of asbestos, particularly in the field of fireproof construction; co-operation between consumer and producer; cultivation of new markets, and development of processes whereby the wastes in the industry may be rendered commercially valuable. The association will establish a bureau that will be devoted to these purposes.

Railroad Equipment Orders.—Among car orders reported by the *Railway Age Gazette* are 1000 gondola cars for the Virginian Railroad, placed with the Pressed Steel Car Company; 75 flat cars for the United Fruit Company, New York, with the Middletown Car Company; 100 produce cars for the Swift Refrigerator Transportation Company, with the Western Car & Foundry Company. The Chesapeake & Ohio is reported in the market for 1500 freight cars, the Detroit United Railway for 100 cars, the Southern Railway for 2600 car bodies, to be placed on second-hand trucks, and the Missouri, Kansas & Texas for 2150 cars. The Lackawanna Railroad has ordered 48 locomotives from the American Locomotive Company; the Buffalo & Susquehanna 10 from the same company; the Carolina, Clinchfield & Ohio six and the Oliver Iron Mining Company eight from the Baldwin Locomotive Works. The Chicago, Rock Island & Pacific is in the market for 75 locomotives and the Norfolk & Western for 50.

The Stark Rolling Mill Company, Canton, Ohio, is the exclusive manufacturer of alomaloyd sheets, which are special analysis sheets coated with aluminum-alloyed metal. The company is especially recommending these sheets for the manufacture of automobile bodies. A circular recently issued states that bodies made of alomaloyd sheets, while of course greatly superior to those made of wood, have every advantage possessed by ordinary metal bodies, and some which the latter do not have. The alomaloyd sheets take a higher and more lasting finish, because of the perfectly smooth, paint-absorbing and thoroughly rustless character of the metal; hence less time, less labor and less expense are involved in the finishing department.

The Garland Corporation of Pittsburgh, controlling the Garland Nut & Rivet Company, Pressed Radiator Company of America and several other interests, has issued its annual report for the year ended December 31, 1909. The net earnings were \$194,224 for the second half as compared with \$103,209 in the preceding six months, making total net earnings after depreciation of \$297,433. This is the best showing ever made and the present outlook suggests a substantial increase in 1910 results.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL— Bar Iron from store—

Refined Iron:	
1 to 1 1/4 in. round and square.....	\$ 2.00¢
1 1/4 to 4 in. x 3/4 to 1 in.....	\$ 2.00¢
1 1/4 to 4 in. x 1/2 to 5/8 in.....	\$ 2.00¢
Rods—1/2 and 11-16 round and square.....	\$ 2.20¢
Angles:	
3 in. x 1/4 in. and larger.....	\$ 2.25¢
3 in. x 3/8 in. and 1/2 in.....	\$ 2.30¢
1 1/2 to 2 1/2 in. x 1/2 in.....	\$ 2.35¢
1 1/2 to 2 1/2 in. x 3/8 in. and thicker.....	\$ 2.35¢
1 to 1 1/4 in. x 3/8 in.....	\$ 2.35¢
1 to 1 1/4 in. x 1/2 in.....	\$ 2.45¢
3/4 x 1/2 in.....	\$ 2.55¢
3/4 x 3/8 in.....	\$ 2.65¢
1/2 x 1/2 in.....	\$ 2.70¢
1/2 x 3/8 in.....	\$ 2.80¢
1/2 x 1/4 in.....	\$ 2.90¢
Tees:	
1 in.....	\$ 2.50¢
1 1/4 in.....	\$ 2.60¢
1 1/2 to 2 1/2 in. x 1/2 in.....	\$ 2.30¢
1 1/2 to 2 1/2 in. x 3/8 in.....	\$ 2.30¢
3 in. and larger.....	\$ 2.30¢
Beams.....	\$ 2.35¢
Channels, 3 in. and larger.....	\$ 2.35¢
Bands—1 1/2 to 6 x 3/8 to No. 8.....	\$ 2.45¢
"Burden's Best" Iron, base price.....	\$ 3.15¢
Burden's "H. B. & S." Iron, base price.....	\$ 2.95¢
Norway Bars.....	\$ 3.50¢

Merchant Steel from Store—

per lb	
Best Cast Steel, base price in small lots.....	\$ 2.00¢
Best Cast Steel, base price in small lots.....	\$ 2.50¢
Best Cast Steel, base price in small lots.....	\$ 2.50¢

Sheets from Store—

black	One Pass, C.E.	R. G.
	Soft Steel.	Cleaned.
No. 16.....	\$ 2.90¢	\$ 3.00¢
Nos. 18 to 21.....	\$ 2.95¢	\$ 3.10¢
No. 22 and 24.....	\$ 3.05¢	\$ 3.20¢
No. 26.....	\$ 3.10¢	\$ 3.30¢
No. 28.....	\$ 3.20¢	\$ 3.50¢

Russia, Plinished, &c.

Genuine Russia, according to assort- ment.....	\$ 12 @ 14¢
Patent Plinished, W. Dewees Wood.....	\$ 10¢
	\$ 10¢

Galvanized.

Nos. 14 to 16.....	\$ 3.30¢
Nos. 18 to 24.....	\$ 3.55¢
No. 26.....	\$ 3.75¢
No. 28.....	\$ 4.10¢
No. 20 and lighter 36 inches wide, 10¢ higher.	

Genuine Iron Sheets—

Galvanized.	
Nos. 22 and 24.....	\$ 5.75¢
No. 26.....	\$ 6.25¢
No. 28.....	\$ 7.25¢

Corrugated Roofing—

1/2 in. corrugated.	Painted	Galvd.
No. 24.....	\$ 4.80	
No. 26.....	\$ 4.90	
No. 28.....	\$ 5.00	

Tin Plates—

American Charcoal Plates (per box.)	
"A.A.A." Charcoal:	
IC, 14 x 20.....	\$ 6.35
IX, 14 x 20.....	7.00
A. Charcoal:	
IC, 14 x 20.....	\$ 5.40
IX, 14 x 20.....	6.50

American Coke Plates—Bessemer—

IC, 14 x 20.....	\$ 4.40
IX, 14 x 20.....	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating.....	\$ 8.50
IX, 20 x 28 with an 8 lb. coating.....	10.50

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):	
1/2 x 6 and smaller.....	70¢ & 7 1/2¢
Larger and longer.....	65¢ & 5¢
Common Carriage (rolled thread):	
1/2 x 6, smaller and shorter.....	70¢ & 12 1/2¢
Phila. Eagle, \$3.00 list.....	\$ 5.00 & 80¢ & 10¢
Bolt ends with C. & T. Nuts.....	65¢ & 5¢
Machine (Cut Thread):	
1/2 x 6 and smaller.....	70¢ & 12 1/2¢
Larger and longer.....	65¢ & 10¢

Nuts

Blank or Tapped.

Cold Punched:	Off list.
Square.....	4.90¢
Hexagon.....	5.30¢
Hexagon, C. T. & R.....	5.30¢
Hot Punched:	Off list.
Square.....	5.40¢
Hexagon.....	5.80¢

Seamless Brass Tubes—

List November 13, 1908.....	Base price 18¢
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Brass Tubes, Iron Pipe Sizes—

List November 13, 1908.....	Base price 18¢
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Copper Tubes—

List November 13, 1908.....	Base price 22¢
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Brazed Brass Tubes—

List August 1, 1908.....	20¢ & 1/2¢
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High Brass Rods—

List August 1, 1908.....	15¢ & 1/2¢
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Roll and Sheet Brass—

List August 1, 1908.....	15¢ & 1/2¢
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Brass Wire—

List August 1, 1908.....	15¢ & 1/2¢
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Copper Wire—

Base Price.....	Carload lots mill 15¢ & 1/2¢
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METALS— Tin—

Straits Pig.....	\$ 30 @ 36 1/2¢
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Copper—

Lake Ingot.....	\$ 14 1/2 @ 15 ¢
Electrolytic.....	\$ 14 1/2 @ 15 ¢
Casting.....	\$ 14 1/2 @ 14 1/2 ¢
Sheet Copper Hot Rolled, 16 oz (quantity lots) \$ 18 ¢	
Sheet Copper Cold Rolled, 1¢ advance over Hot Rolled.	
Sheet Copper Polished 20 in. wide and under, 1¢ square foot.	
Sheet Copper Polished over 20 in. wide, 2¢ square foot.	
Plinished Copper, 1¢ square foot more than Polished.	

Spelter—

Western.....	\$ 7 1/2 @ 7 1/2 ¢
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Zinc.

No 9, base, casks.....	\$ 8 1/2 @ 8 1/2 ¢
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Lead.

American Pig.....	\$ 5 1/2 @ 5 1/2 ¢
Bar.....	\$ 6 1/2 @ 6 1/2 ¢

Solder.

1/2 & 1/2, guaranteed.....	\$ 21 1/2 @ 22 ¢
No. 1.....	\$ 18 1/2 @ 19 ¢
Refined.....	\$ 16 1/2 @ 17 ¢
Prices of Solder indicated by private brand vary according to composition.	

Antimony—

Cookson.....	\$ 10 @ 10 ¢
Halletts.....	\$ 10 @ 10 ¢
Other Brands.....	\$ 9 1/2 @ 9 1/2 ¢

Bismuth—

Per lb.....	\$ 2.00 @ 2.25
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Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting.....	\$ 34 ¢
Rods & Wire.....	Base Price 31¢
Sheets.....	Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York	Cents
Copper, Heavy cut an; crucible.....	11.75 @ 12.00
Copper, heavy and Wire.....	11.25 @ 11.50
Copper, Light and Bottoms.....	10.25 @ 10.50
Brass, Heavy.....	8.00 @ 8.25
Brass, Light.....	6.50 @ 6.75
Heavy Machine Composition.....	10.50 @ 10.75
Clean Brass Turnings.....	7.50 @ 7.75
Composition Turnings.....	8.75 @ 9.00
Lead, Heavy.....	3.75
Lead, Tea.....	3.50
Zinc Scrap.....	4.50

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